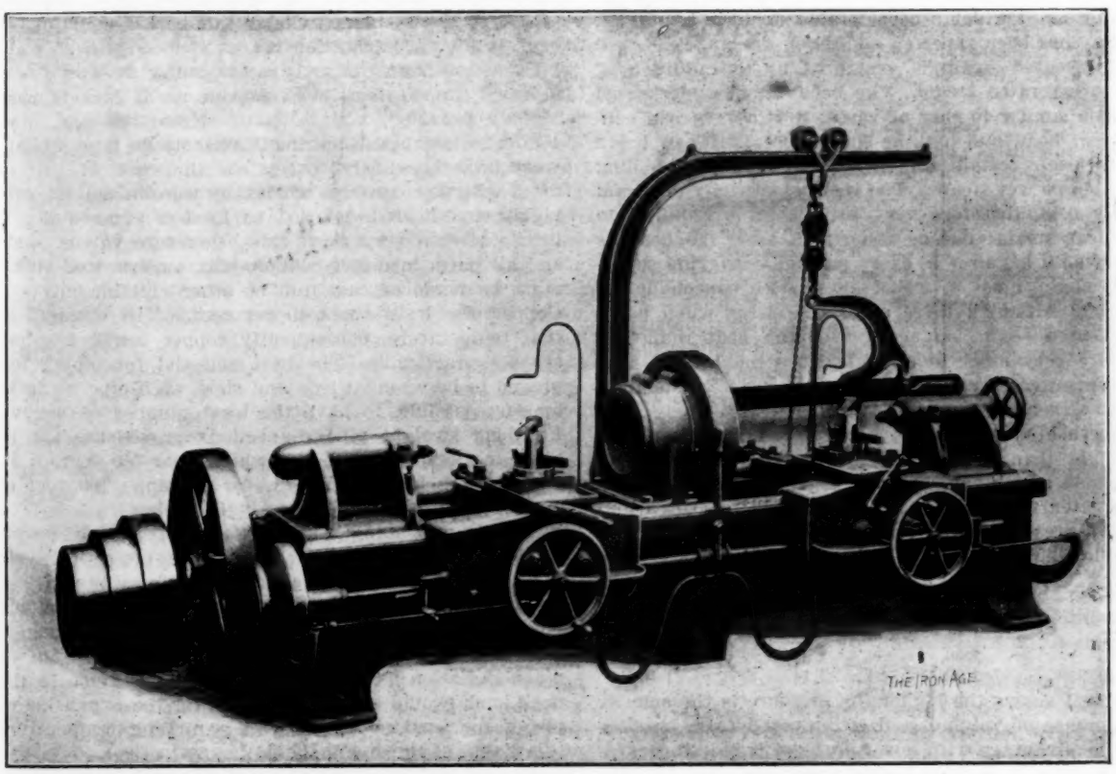
THE IRON AGE

THURSDAY, NOVEMBER 7, 1901.

The Putnam Extra Heavy Double Axle Lathe.

The lathe here illustrated, built by the Putnam Machine Company of Fitchburg, Mass., is designed for turning both ends of axles at the same time. It swings 27⅞ inches over the bed, 14 inches over the carriages, and will take in 8½ feet between centers, the bed being 12½ feet long. The carriages are independent, conveniently arranged, and have three positive feeds for roughing and finishing cuts, operated and controlled by hand wheels within easy working reach. The driving head has a 13-inch opening, through which the axles are passed, revolved on dead centers and finished complete without reversing. It is operated by spur gearing driven by a 26-inch cone of three changes for 5-inch belt, and geared 30 to 1. It is provided with an equalizing or self centering dog ring, which centralizes the driving strain on the axle. The bearing has compressed babbitt lining and adjustable take up.



THE PUTNAM EXTRA HEAVY DOUBLE AXLE LATHE.

The carriages have a quick hand movement on the bed, and are complete with tool posts, tool rings, drip troughs, automatic lubricating pipes and stop cocks. They are fitted with large front ways, and also flat surface ways directly under the tool posts, which serve to arrest vibration when heavy cuts are being taken. There are automatic safety stops which make it impossible for the carriages to collide or run against the driving head. The feed works are powerfully geared, have phosphor bronze pinions and extra strong mechanism, which imparts motion to the carriages through a massive steel rack. The ratio of feeds to one revolution of the axle is ⅛, 3-16 and ¼ inch.

The tail stocks are secured to the bed by four large anchor bolts, and are cut away on the back to facilitate access to the work. They have large steel spindles, center oilers and are longitudinally adjustable on the bed. The right hand tail stock spindle is operated by a screw and hand wheel, and has a split binder. The driving cone is furnished with self oiling anti-friction bearing. The machine is provided with a reservoir into which the drip is conveyed after having been strained. A rotary pump forces the lubricating liquid onto the cut in desirable quantities. A steel crane having ball bearing and suitable lifting mechanism for handling work to and from the centers is a part of the equipment. This lathe is also furnished with a longitudinally adjustable driving head with 16-inch opening, and is made in 12½, 16½ and 20½ foot lengths of bed, admitting 8½, 12½ and 16½ feet between centers. Without the crane the machine weighs 12,175 pounds.

The United States Tube Company.

The United States Tube Company expect to have a portion of their fine new plant in Buffalo in operation before the present month closes. The plant is located on Kensington avenue and the Delaware, Lackawanna & Western tracks. It is understood that the company will start in with orders enough to keep them running all winter, with promises enough more to tax the full capacity of the plant for over a year. In preparing for operations the company have found that the unexampled activity in manufacturing industries, especially in the iron and steel trade, has delayed the work of equipping the plant. Machine shops have been unable to turn out the necessary machinery as rapidly as required, while the new factories going up and the enlargement of old ones have served to create a big demand for machinery. For these reasons the new Buf-

falo plant will start at about half its capacity, employing from 150 to 200 men. By February it is hoped to have the other portion of the works in operation, when the number of hands employed will be doubled.

The new plant of the United States Tube Company will be one of the best equipped in the country. All of the machinery, with the exception of the welding machinery, will be operated by electricity. However, it is stated that the company will not use the transmitted electric energy from Niagara, but will operate their own electric plant. The welders will be operated by steam.

Highly Superheated Steam in Engines.*

BY R. LENKE OF ERITH.

In no branch of heat engine building has such an amount of study been spent as in steam engines, from Watt's time up to to-day. The economy of the steam engine is, in spite of all efforts, not the best, and the steam engine in its highest perfection attainable at present cannot claim the first place in comparison with other heat engines. And so the problem of generating and using superheated steam has become a question, from the solution of which a considerable stride in improving economy has been expected and really made.

Superheated steam is generated by the addition of heat to saturated steam. The behavior of superheated steam is similar to that of gases; it is a very bad conductor of heat, and has the special peculiarity of being able to lose a certain amount of heat without becoming saturated or wet steam. The thermal capacity of steam is only 0.48, therefore very little heat is required to superheat steam; but as the steam loses the heat as quickly as it acquires it, every passage conveying superheated steam must be well covered with nonconducting material. Although there are some losses when using superheated steam on account of the heat radiation, they are very much smaller, because the loss of heat from superheated steam has lower calorific value than the latent heat of saturated steam.

Superheated steam has a greater volume per unit of weight than saturated steam at the same pressure, hence one advantage, and the higher the temperature the greater this advantage. At various pressures and temperatures the increase of volume may be taken from the following Table I:

Table I.

Pressure.	390 degrees F.	570 degrees F.	750 degrees F.
70	1.1	1.33	1.57
115	1.06	1.29	1.52
170	1.02	1.24	1.46

Table I shows the higher the pressure is the smaller the increase of volume, and it is proved from practice that the advantage with lower pressure is indeed greater in proportion than with higher pressures.

The question may arise whether the increase of volume does not require more additional heat than the benefit derived from it is worth. To show this clearly, Table II has been prepared expressing how many British thermal units less are required to produce 1 cubic foot of superheated steam than of saturated steam at the same pressure. For various pressures and temperatures the total heat per cubic foot is as follows:

Table II.

Pressure.	Saturated.	390 degrees F.	570 degrees F.	750 degrees F.
70	233	219	192	175
115	350	337	297	267
170	492	485	432	398

i. e., to produce, for example, 1 cubic foot of steam at 115 pounds pressure and a temperature of 570 degrees F.,

$$\frac{350 - 297}{350} = 15 \text{ per cent.},$$

less heat is required than to produce 1 cubic foot of saturated steam at the same pressure. With saturated steam engines 20 to 25 per cent. of admitted steam is condensed during the admission period, consequently the practical steam consumption is very much in excess of the theoretical. Superheated steam does not condense during this period if sufficiently superheated, hence another advantage.

The economy effected by using superheated steam in engines is very remarkable, and, acknowledging this fact, a great number of steam users all over the world superheat the steam, although in many cases only a few degrees, yet a considerable saving in steam and coal is always the result. To obtain the full benefit the required temperature of steam is 660 to 700 degrees F., and to stand this temperature the engines must be specially designed. It is not sufficient to use mineral oil with a very high flash point, and any one who tries to supply an existing engine of any kind with steam at that temperature will have a very unpleasant experience, even when using the above mentioned oil.

The introduction of superheated steam into engines largely influences the expansion of the heated parts. Engines always gave great trouble when the distribution of metal in the cylinders was not uniform, as parts with more metal expanded most and forced the cylinder walls toward the inside and made the cylinder out of shape. When using liners in the cylinders they were squeezed in at the ends, decreasing the diameter and jamming the piston body if sufficient clearance was not provided. With steam jackets heated with steam of 500 degrees F. the lubrication ceased as the cylinder walls became too much heated, consequently it was found necessary to do away with jackets, or if jackets were already provided, not to pass steam through them. Pistons constructed on the Ramsbottom type always worked satisfactorily, except in the case of pistons fitted with steel springs, when they were in contact with highly superheated steam. Any kind of gun metal gets brittle after a very short time, therefore valves, seats and all parts in direct contact with superheated steam must be made of cast iron or other suitable mixture. Copper also loses about 40 per cent. of its strength at that temperature, consequently copper bends in pipes are not practicable. The best material for piping has proved to be wrought iron and steel, each pipe being as long as possible, to have the least number of flanges. For long straight pipe connections provision must be made to meet the expansion, which is, at 700 degrees F., 0.037 of the length, so that, for example, 100 feet of pipe extends 0.37 foot, or nearly 4½ inches.

Glands and stuffing boxes at first frightened users, so the engines were constructed single acting to avoid the use of glands, but no serious difficulties have arisen on that account. It is advisable to place the stuffing box as far as possible from the cylinder end to keep it well away from the hottest parts, and to allow of as much radiation as possible. Sufficient clearance in the neck bush should be made to allow for the expansion of piston rod, and no metal with a melting temperature below that of the steam should be used.

Valves and valve gears are influenced in the same way by superheated steam. Valves containing many ribs or different thicknesses of metal—in section—such as plain slide valves or Corliss valves of the usual construction, are not suitable for high temperatures. A Corliss valve of medium size will stand 480 to 500 degrees F., but no more, and the latter temperature very seldom. The smaller the plain slide valves are the higher temperature they will stand. Large slide valves will hardly stand even slightly superheated steam if no provision is made for forced lubrication of the valve face.

Piston valves have proved to be most suitable for the highest temperature, owing to their uniform distribution of metal, but even with this sort of valve certain experience is necessary to get them in good working order. With ground valves, the ribs holding the boss for the valve spindle must not begin within the working surface of the valve, but have to be placed beyond that, because they expand and make the valve polygonal. The valves must be ground in other liners than those in which they are to work in the engine; the former liners have to be smaller in diameter to secure more clearance to provide for the expansion of the valves; all ribs must be placed beyond the working surfaces of the valve. The cylinder expands in length more or less than the steam chest, causing thereby deformation of the latter,

* International Engineering Congress, Glasgow, 1901.—Section III, Mechanical.

which must be carefully considered in design. It is best to work the valves in liners fixed in the cylinder and with a small clearance, sufficient to allow for the deformation of the steam chest. With this construction it is of course necessary to make steam tight joints between the several ports, and this is best done by stepping the liners and seats and using narrow asbestos rings for each step. The liner is then forced onto the small seats by set screws in the cover, these asbestos rings making a lasting joint. Long valves cast in one piece become scored, whether they are cooled from inside with exhaust steam or not; consequently all valves should be made as short as possible. Rings and springs in valves cannot be recommended, as the steam comes behind the rings and increases the pressure, causing friction and therefore increased oil consumption. As it is impossible to rely on tightness of piston valves, they must be made as small in diameter as possible. It may be stated here that superheated steam can travel at 30 to 40 per cent. higher speed through steam ports than saturated steam, and this fact has to be considered during construction.

Two piston valves working one in the other, as the Rider or Meyer valves, are impracticable for superheated steam. If engines of that type are intended to be worked with superheated steam, each valve must work in a separate chamber. Double beat valves can also be recommended as being safe, but they require a special arrangement, which is not always obtainable with every gear. Very often it happens when warming up the engines that the valve spindles get hotter than the gland boxes, and on starting the engine, the friction between spindle and stuffing box is greater than the power of the spring, and if the valves are not positively driven they remain open during the full stroke. An engine constructed in accordance with the principles just explained is as safe with superheated steam as any other engine with saturated steam. From the experience over several years it is not necessary to be bound to single acting engines.

Besides the economy the use of highly superheated steam has some other advantages which are also important. It makes the steam consumption nearly independent of the size of engine, as a small engine has about the same steam consumption as a large one, as for example: An 80 horse-power compound condensing engine uses 10.45 pounds of steam at 160 pounds pressure and a 1000 horse-power engine uses 9 pounds of steam per indicated horse-power per hour. The use of highly superheated steam does not require high boiler pressures; 160 pounds is the highest to be recommended, as no advantage can be derived by exceeding this. As the amount of heat transmitted from the steam to cylinder walls, and *vice versa*, is much lower with superheated steam than with saturated steam, the whole range of temperature from boiler pressure to vacuum can take place in one or two cylinders, so that the use of a triple expansion engine does not make the slightest improvement in economy. It is not intended to be understood that the author proposes to do away with all triple expansion engines; for very large plants their use will be necessary for constructive reasons.

With regard to economy obtained from engines working with superheated steam, the gain is derived from the larger volume of the steam and the doing away with initial condensation. Generally the steam consumption of modern engines working under good conditions may be taken as follows: Single cylinder condensing engines with saturated steam and a pressure of 90 to 100 pounds per square inch use 19 to 25 pounds of steam per indicated horse-power per hour, corresponding to 373 to 490 B. T. U. per minute. The great difference in temperature between admission and exhaust steam causes much waste by initial condensation, and consequently this type of engine especially favors the use of superheated steam. With superheated steam the consumption has been lowered to 13½ to 15 pounds, corresponding to 290 to 335 B. T. U.

Noncondensing single cylinder engines gave consumptions of 15 to 18 pounds of steam per indicated horse-power per hour, which is about the same consumption as an average compound condensing engine with saturated steam. The noncondensing compound engine decreases the consumption to 14 to 16 pounds per indicated horse-power per hour. The compound condensing engine is the most economical, and the economy obtained can hardly be reached by a quadruple expansion engine working at a pressure of 300 pounds. The steam consumption of such an engine—either compound or tandem—at 140 pounds pressure only, never exceeds 10 pounds per indicated horse-power per hour, and usually remains below, many tests having proved 8.5 and 8.8 pounds consumption per indicated horse-power. To utilize better these temperatures, and to work with various loads with safety and nearly uniform economy, Mr. Schmidt has introduced the receiver heater with automatic valve. The idea is to keep a steady mean temperature of cylinder walls not higher than will make the lubrication unreliable for different rates of expansion.

A few words may be said with regard to the cost of a superheated plant. Superheated steam engines use on an average 30 to 40 per cent. less steam than saturated steam engines of the same type. Consequently boilers can be made 30 per cent. smaller, and the difference in price will nearly cover the cost of the superheater. For the same steam consumption the superheated steam engine is cheaper, as it may be worked with a lower boiler pressure, and it is simpler—*i. e.*, instead of a compound engine with saturated steam, a single cylinder engine with superheated steam may be used, giving the same or better results than the former.

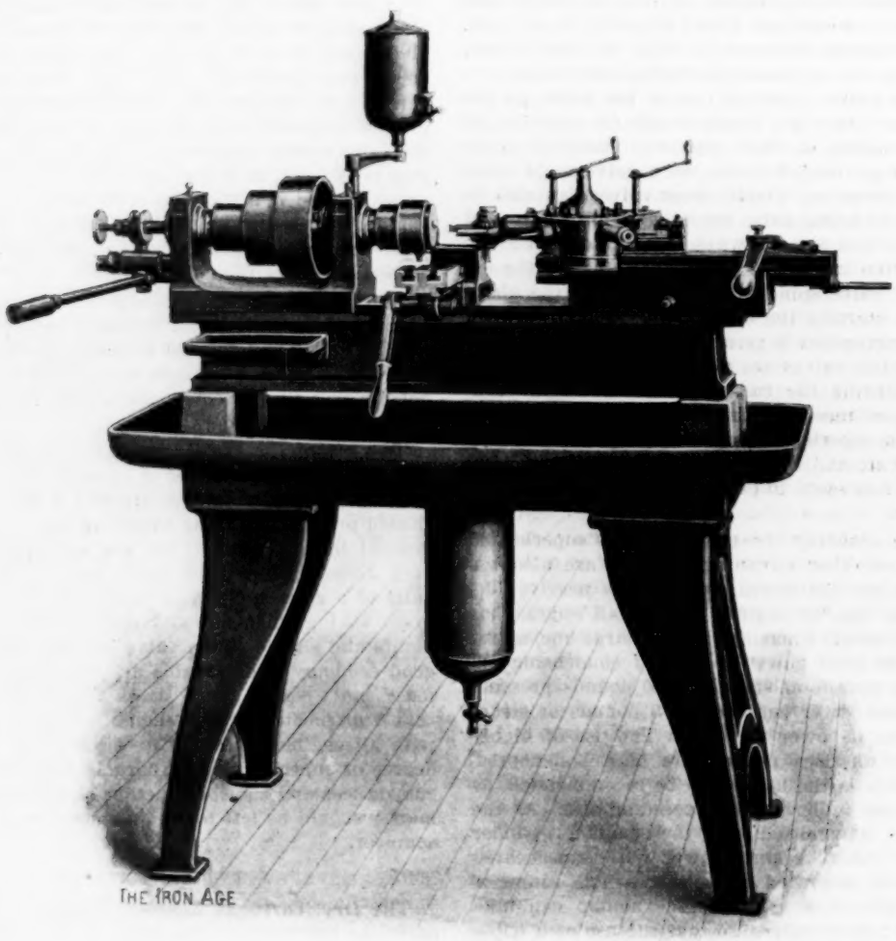
With regard to oil consumption, it was found not to be more than that of an ordinary saturated steam engine. For example, a 120 indicated horse-power engine used in 24 hours 4 pounds of oil, and a 300 indicated horse-power Corliss compound engine 2.2 pounds in ten hours for both cylinders.

In view of the great advantages of steam superheating, and the great number of engines running at present satisfactorily, it is astonishing that a few failures have caused prejudices among some engineers, who make the general introduction of the use of superheated steam very difficult. It will be worth mentioning that the results of a great number of trials have always proved a great saving in steam and coal, and even with small plants and simple piston valve engines almost the same good economy is obtainable as with large engines with most exact valve gears. It is therefore recommended that superheated steam should be used in connection with all engines; the only question to be settled is the degree of superheat, which largely depends on local circumstances and the construction of the engine, and this matter should be left to the judgment of an experienced engineer.

The Dry Tortugas Coaling Station.—The Navy Department has revoked the contract of the Union Bridge Company of New York City for the construction of a coaling station at Dry Tortugas, Fla., and has amended the specifications applying to that work. Bids will be opened at the Bureau of Yards and Docks on December 2 and the delinquent contractors will be compelled to reimburse the Government for the extra expenses involved in the matter. The time for the completion of the work is changed to nine calendar months from the date of new contract made for the completion of the work. A schedule of prices for partial payments will be arranged upon the basis of the contract price to complete. The provisions of the original specifications in regard to the receipt of bids are so far modified as to require proposals for completing the work at Dry Tortugas in accordance with the contract, specifications and agreements, and these addenda, and the plans to which they refer, which can be seen at the Bureau of Yards and Docks, Navy Department, and at the naval station, Key West, Fla. The provisions in the original specifications with respect to penalties and premiums are modified to read: "For each calendar day of delay in the completion of the work beyond the time to be limited in the new contract there shall be deducted from the contract price as liquidated damages the sum of $20."

The Pratt & Whitney Screw Machine Adapted for Key Work.

Our readers are familiar with the screw machine built by the Pratt & Whitney Company of Hartford, Conn., which is shown in the half-tone engraving, Fig. 1. For the purposes of the present article it is not necessary to mention more than the principal features of this tool. In this machine the turret usually receives six distinct tools, including the gauging stop, but may be made when desired to carry either four or eight tools. On these machines every operation except the slotting of the head in the production of screws from wire or rod is performed successively without the removal of the work from the collet, stoppage of the machine, or change of tools. The turrets are self rotating and self fastening. The tools are held firmly in the turret by means of a clamp which, by the partial turning of a binding screw, embraces the tool shank. The wire feed attachment is simple in construction and efficient in operation. It is not liable to derangement, and is operated by the movement of a hand lever. A forward movement of the lever opens the jaws of the collet and feeds the rod forward to a length regulated by an adjustable stop gauge held in the turret. The reverse movement closes the jaws, which hold the rod firmly. These movements are performed instantaneously without stopping the machine, so that the use of the device results in a great saving of time. There is furnished, when ordered, a back geared double friction head which permits of change from fast to slow motion instantly by a short movement of the lever without stopping the machine. There may be also attached to the turret a power feed mechanism having adjustable automatic stop motion.



THE PRATT & WHITNEY SCREW MACHINE ADAPTED FOR KEY WORK.

Equipment for Key Work.

The features of the machine in which we are at the present time particularly interested are features which greatly increase its scope and the rapidity of its operation. The key upon which the work is to be performed has a shank and winged head, and by the latter it is grasped by a chuck of special design. One side of the key is slabbed, this operation being performed by a turret tool also designed for this particular purpose. Both of these tools are the invention of Clarence L. Goodrich of the Pratt & Whitney Company, and are described in their main details in the following: Before doing this it may be well to mention that the chuck can be operated instantly, that its design is such as to provide a powerful grip, these operations being performed while the machine is in motion. The slabbing tool is carried by the turret of the machine, and is brought into operation in the same way that the other tools are.

The Chuck.

The drawings, Figs. 2 to 8 inclusive, show the construction of the chuck operating device. Fig. 2 is a longitudinal section through the spindle and chuck, Fig. 3 is an end view looking from the left in Fig. 2, Fig. 4 is a section on the line 3 3 of Fig. 2; Fig. 5 is a section on the line 4 4 of Fig. 8, and Fig. 6 is a side view of the front end of one of the work carriers with its work feeding device arranged to deliver an ordinary valve plug. In this figure the head of the plug is shown entering the jaw. Fig. 7 is a front view of the jaws of one of these work carriers and Fig. 8 is a modified arrangement. The chuck *a* is fitted upon the end of the spindle *b*, which carries the usual cone pulley *c*. It is formed with opposing jaws, *d d'*, which are fitted to slide transversely in suitable ways. The pinion *e* is jour-

naled in the chuck in such a way that its axis is parallel with the movement of the jaws. The extended ends of this pinion, as indicated in Figs. 4 and 5, are provided with right and left hand threads, which engage the jaws. End movement of the pinion is prevented by a shoulder.

In order that the pinion may be rotated to operate the jaws during the operation of the work carrier it is provided with a plunger, *g'*, sliding freely in the bore of the spindle. This plunger is made hollow in order to permit the insertion of rods which are to be operated upon. Its forward end carries a rack engaging with the pinion *c*, so that it serves to operate the jaws of the chuck when moved longitudinally. The plunger is splined to the chuck. Upon its left hand end is a dog, the arms of which extend outwardly through slots, *i*, in the spindle, and are clamped in the clutch sleeve *j*. The latter has an annular groove, *j'*, into which enters the fork *k*, which may be moved along the stud *k'* by means of a hand lever, *l'*, and by this means operates the plunger which is in mesh with the chuck pinion.

From the foregoing it will be perceived that the chuck may be operated equally well whether the spindle is at rest or moving in either direction. In order that the device may be operated while the machine is in motion there is provided a work carrier, Fig. 6, which delivers the work automatically to the chuck. The collet *m'* is mounted to slide in a seat in the turret, being pressed outwardly by the spring *n'*, the extent of its motion being controlled by the nut *o*. The front end of the collet is recessed to received the shank of the plug. The chuck has two projecting guides, which act to guide the work between the jaws of the chuck as it is moved forward. The operation of the work delivering device is also independent of the direction of rotation.

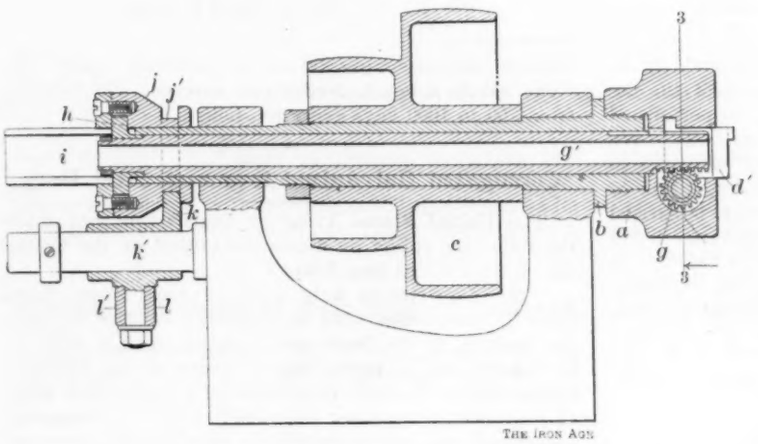


Fig. 2.—Longitudinal Section through Spindle.

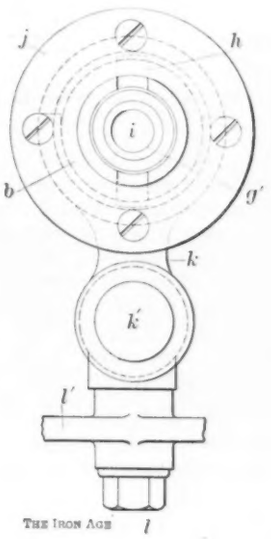


Fig. 3.—End View Looking from the Left Fig. 2.

THE PRATT & WHITNEY SCREW MACHINE ADAPTED FOR KEY WORK.

On account of the fact that it is frequently necessary to rotate the same piece of work first in one direction and then in the other, the guides on the chuck are beveled back to the level of the face of the jaws. For the same reason the collet is pressed forward by a spring, so that if the work should be presented to the chuck while the latter is rotating in the wrong direction these inclined portions of the guide will force the collet back against its spring, thus avoiding all damage. This beveling of the guides also facilitates the entrance of the work when the carrier is rotated in the right direction, by increasing the angle of the arc through which the work may find its way between the guides and into the openings. The collet is prevented from rotating with the work by means of a spline.

Modified Construction.

In Figs. 5 and 8 is represented a modified construction of the work carrier which greatly extends its scope. This differs from that already described chiefly in the fact that the plunger may be rotated as well as moved longitudinally. The result of this is that the jaws may be given a greater range of automatic movement, which, as here shown, is limited to the longitudinal movement of the plunger. To extend this range of movement, and also when desired to increase the force of the gripping action, the plunger *r*, Fig. 8, is formed at its right hand end with the worm *q* instead of the rack mentioned above. In place of the pinion there is substituted the worm wheel *p* engaging with the worm. It will be seen that with this arrangement the worm wheel may be operated to open and close the jaws of the chuck by either the rotary or the longitudinal movement of the plunger, or by both of these movements, either simultaneously or in sequence. In order to move the plunger it is provided at its left hand end with a friction disk, *s*, faced with a ring, *t*, of leather for engaging with the side of the clutch *d*, which, like the one just described, slides on a stud. This plunger is formed with shoulders constituting a thrust collar, *w'*, which takes the thrust of the worm, and at the same time limits the longitudinal movement of the plunger. Screwed to the plunger is a collar, between which and the friction disk is a spring, *w*, which serves to press the spindle toward the left, and to cushion the action of the clutch against the friction disk.

The jaws of the work clutch may be closed by moving the plunger toward the right, or by holding the plunger against rotation, while the work carrier is moving in the direction of the arrow 67, Fig. 5. It is obvious that the device may be adapted to close the jaws by reversing either or both of these movements by altering the direction of the lead of the threads on the worm and worm wheel. Whatever may be the preliminary movements the resistance of the jaws to the closing movement ultimately reacts through the worm gear as a nut to thrust the plunger toward the left, jamming its collar, *w'*, tightly against the collar bearing against the spring, and which, therefore, takes the pressure of holding the work. But since both this collar and the plunger rotate with the spindle when the work is gripped and while it is being operated upon there is then no loss of power through friction with external or stationary parts. When it is desired to release the work the direction of rotation of the spindle is reversed and the clutch is again brought against the friction disk to stop the rotation of the plunger.

Turret Milling Tool.

As previously stated, one side of the key, or plug, is to be slabbed. This work is accomplished while the ma-

chine is in motion by means of the milling tool, shown in Figs. 9 to 12, which is carried by the turret head. It is well known that the ordinary turret heads are usually adapted only to the turning of circular surfaces, or those which are concentric with the axis of rotation of the work or the tool, as the case may be. But it is frequently necessary to drill a hole or mill a surface which is not thus concentric. For this reason it has hitherto been considered necessary to make a separate operation of these unsymmetrical parts, or to stop the work carrying spindle while the cut is being made by an independently operated tool. But by means of the device here considered these operations may be performed while the machine is in motion in the usual way. We may state in parenthesis that the letters of reference in Figs. 10 to 12 do not represent corresponding parts of the drawings formerly considered. The work is carried by the chuck *a*, Fig. 10, the milling apparatus being mounted in the turret *e*. In the collet *f*, which is clamped to the turret in the usual way, is rotatably mounted the body *g* of the tool, which is held in place by the nut *h*. The chuck is provided with engaging abutments so disposed as to bring the cutting tool into the required relation with the work. The tool frame receives the spring actuated coupling pin *j*, which is carried in the arm *i*, this pin entering a suitable recess formed in the chuck.

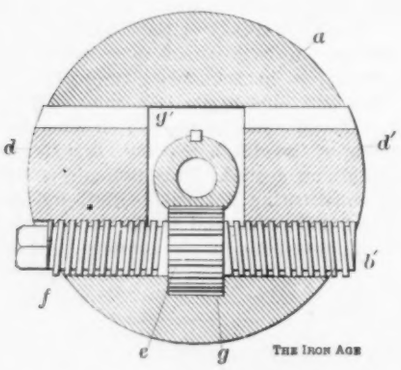


Fig. 4.—Cross Section on Line 3 3 of Fig. 2.

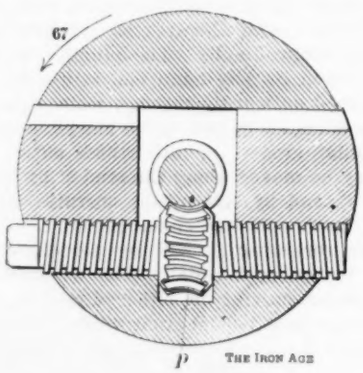


Fig. 5.—End View on Line 4 4 of Fig. 8.

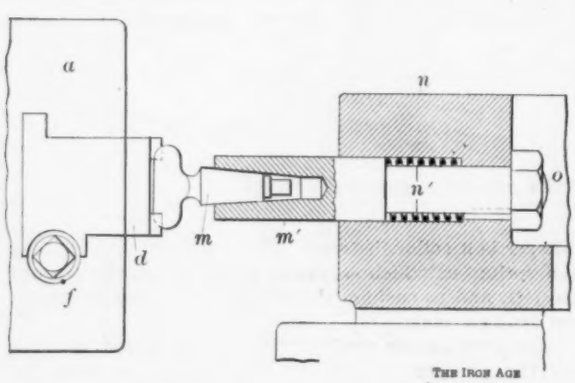


Fig. 6.—Side Sectional Elevation of Work Carrier.

Since in this case the milling tool is required to slab only one side of the key, there is no provision made for indexing to different positions, and it contains but one coupling pin. Provision is made so that if the pin be inadvertently brought forward against the chuck while the latter is rotating rapidly in the wrong direction no harm will result.

The spindle *o* is mounted to rotate in the body of the frame, in this case being placed at right angles to the axis of rotation. In order to rotate the spindle when its frome, *g*, is rotated the spindle is suitably connected with a nonrotating driver. In order to accomplish this there is secured to the spindle the beveled gear *o'*, which meshes with the bevel gear o^2 cut in the end of the stationary collet *f*, which thus serves as a driving gear for rotating the spindle *o*, when the frame *g* is rotated with relation to the collet. The photograph, Fig. 9, will serve to make clear this construction.

It will be understood from the two constructions described that modifications may be introduced, which will adapt them to an extremely wide range of work hitherto not accomplished in the ordinary screw machine. With a boy to feed it this machine will turn out from 750 to 1000 keys every ten hours.

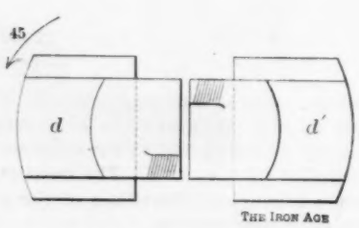


Fig. 7.—Front View of Jaws of Work Carrier.

THE PRATT & WHITNEY SCREW MACHINE ADAPTED FOR KEY WORK.

Corrugated Galvanized Iron and Steel Duty.

The United States Treasury Department has made the following ruling on a case submitted by the Collector of Customs at San Juan, P. R.:

"The Department duly received your letter, dated June 11 last, concerning an apparent conflict between the decision of the Department, dated April 1, 1901 (T. D. 22,929), and an unpublished decision of the Board of United States General Appraisers, in a case which arose at your port, concerning the classification of corrugated galvanized iron sheets, valued at more than 3 cents per pound.

"The Department is in receipt from the Board of a copy of the decision in the matter of the protest of Palacios & Co., referred to by you, from which it appears that the merchandise was assessed for duty at 1 2-10 cents per pound under paragraph 135, and two-tenths of 1 cent per pound additional in accordance with the provisions of paragraph 132 of the tariff act of July 24, 1897. The importers claimed that the same was properly dutiable at the rates provided in paragraphs 131 and 132, respectively, of said act.

"It is manifest that, as the sheets were valued at more than 3 cents per pound, they were excluded from classification under said paragraph 131, which provides for sheets of similar character, 'valued at 3 cents per pound or less,' and the Board so held in overruling the protest and affirming the assessment of duty.

"The merchandise in the case was entered on June

22, 1900, a date long anterior to the date of the Department's decision above alluded to, although the decision of the Board was rendered May 28, 1901.

"You are, therefore, hereby instructed to assess duty on galvanized iron sheets, corrugated or crimped, when valued at more than 3 cents per pound, at 45 per cent. ad valorem under paragraph 193, and at two-tenths of 1 cent per pound additional for galvanizing under paragraph 132 of the existing tariff act, while on similar sheets of steel duty must be assessed under the provisions of paragraph 135, and likewise the additional duty in accordance with paragraph 132 of said act, under the Department's decision (T. D. 22,929, dated April 1, 1901)."

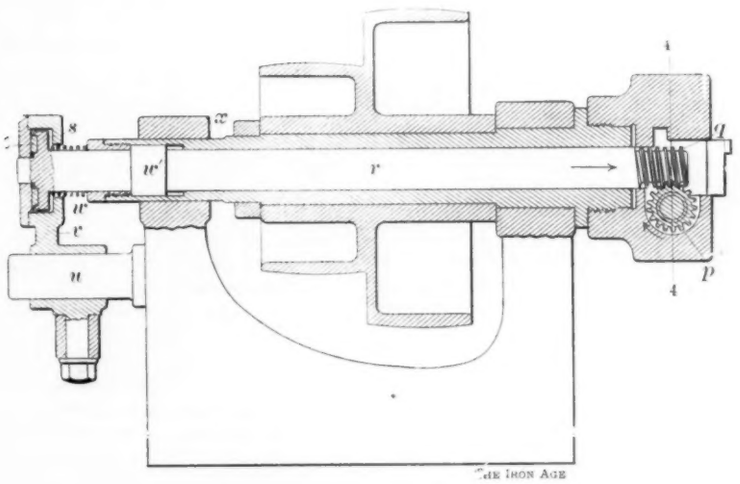


Fig. 8.—Longitudinal Section of a Modified Arrangement of Work Carrier.

Shipping, Shipbuilding and Steel in Scotland.

GLASGOW, October 17, 1901.—The demand for new ships seems to have dried up for the present, and though shipbuilders have plenty of orders booked they are now entering many more. Nor is the reason far to seek. The very low level to which ocean freights have descended precludes any possibility of profit in most branches of the shipping trade. Indeed, on most of the long voyage charters one hears of just now there must be certain loss, for while freights are lower bunker coal is not. It is six or seven years since freights on the principal routes were as low as they are now, but coal then was about 50 per cent. cheaper, and stores and other expenses were proportionately lower. There is, in short, no doubt whatever that the shipping industry after a pretty long term of prosperity is again in a very bad way. And not only is there no prospect of improvement, but there is every reason to believe that things will be worse before they can be better. There is, for instance, no prospect of any increase in the volume of sea trade, with depressed industries on the continent of Europe, shortages in the maize and other crops of America, and a restriction which promises to last some time of the exports of manufactures from the United States. Therefore, unless vessels are laid up with a liberal hand the oversupply of tonnage will result in still further depression. Some few owners are already preparing to take their vessels out of commission during the winter, but the majority seem bent on pegging away anyhow, and some smart losses are being incurred. The evil will work its own cure in time, but the amount of new tonnage at present in course of construction in this country, in Germany and in America has to be reckoned with. A great deal of this new tonnage is for the regular lines, but there is an appalling proportion of the cargo tramp order, and heaven only knows where it is all to find employment after it leaves the builders' hands. There has been plenty of cargo to carry this year, low as markets and freights have been, but there will be less and less as the months pass and as the world's shipping increases.

It is not to be denied that the outlook is very serious, and that the seriousness is not confined to this country. It is, no doubt, something to be thankful for that two such great industries as shipbuilding and engineering are at present supplied with work for months

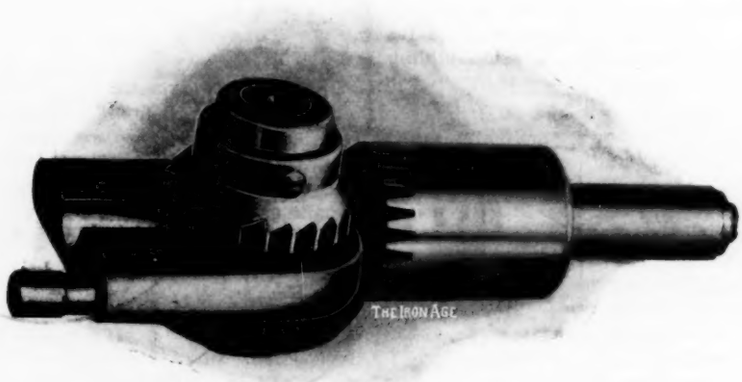


Fig. 9.—Turret Milling Tool.

THE PRATT & WHITNEY SCREW MACHINE ADAPTED FOR KEY WORK.

to come. That means the active employment of a vast army of workmen, not only in the ship yards and engine shops, but also in the allied iron and steel works. But the reaction will be severe, as the contracts are worked off, unless a great improvement in international trade gives a new impetus to shipping. The only profitable employment of British ships just now seems to be in connection with the South African War. When that war is really over there will doubtless be a great industrial and commercial revival in South Africa, but there will also be a large amount of tonnage set free from transport service to resume place in the ocean competition.

The effect of all this has not yet been felt in the iron trade, but it will be in time. For the present iron and steel makers are very well employed, and they would be tolerably well content if only foreigners ceased to trouble and the coal question was at rest. Their great complaint is the lowness of prices for manufactured products in relation to crude iron, coal and wages. And prices are being more and more cut into by Belgian and German producers. German ship plates are now being delivered right into the shipbuilding centers; German steel has reached the Midlands, and German pig iron (hematite) has even penetrated Scotland; while Belgian material driven out of Belgium itself by the Germans is being pressed for sale everywhere. This German competition is not a healthy development, but a sign of industrial disease. In order to keep works employed and to sustain the steadily shrinking home markets, producers are helped by the bounties granted by the iron and steel syndicate to force their products into foreign markets. It is a ruinous business which can only end in disaster if continued, but while it continues it keeps down our markets. Perhaps, by the time the Germans are tired of working at a loss, consumption on your side will have eased down and we shall be treated to a new rush of American material! Man—especially in the iron trade—never is, but always to be, blest. Generally speaking, I think it may be said that there is a diminution of buoyancy in the steel trade since this month opened. It is certainly the case in Scotland.

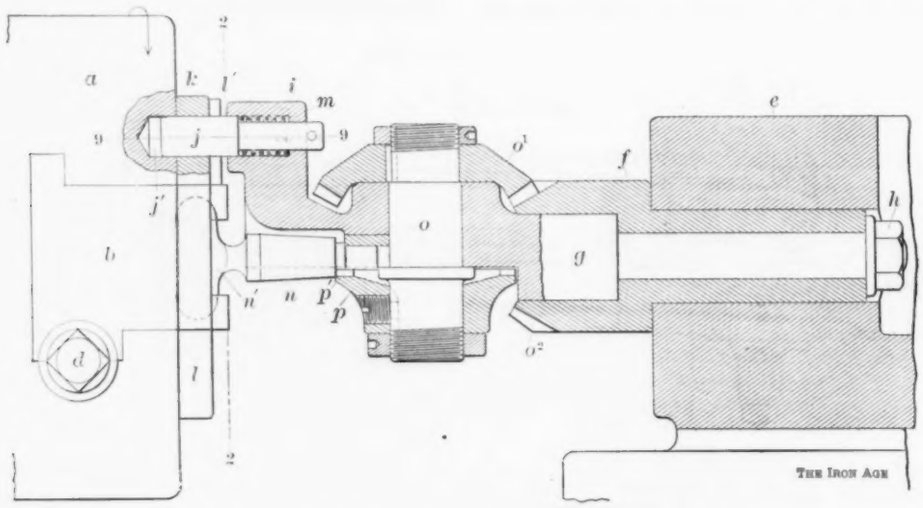


Fig. 10.—*Longitudinal Section Fig.* 9.

The steady demand which continues for pig iron is evidence, however, of good employment still in the finished iron and steel works. It is certainly not due to foreign requirements, for our exports last month were only 70,474 tons, as compared with 112,947 tons in September, 1900. In some parts of the country there seems to be a positive scarcity of crude iron, and in Scotland it is going direct into consumption as steadily as smelters can turn it out. It is understood that the stocks held by makers are no more than is required in the normal course of trade, and the quantity in public stores in Glasgow is only about 58,000 tons—a mere trifle. Yet the output of the second half will be greater than in the first half of the year, for we have now 84 furnaces in blast as compared with 81 a year ago. More furnaces have also been lighted up in Cumberland and the Midlands, and at the beginning of this month there were 343 furnaces in blast in Great Britain, as compared with 328

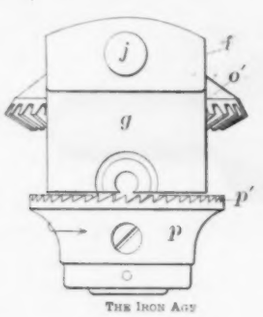


Fig. 11.—*End View Milling Tool.*

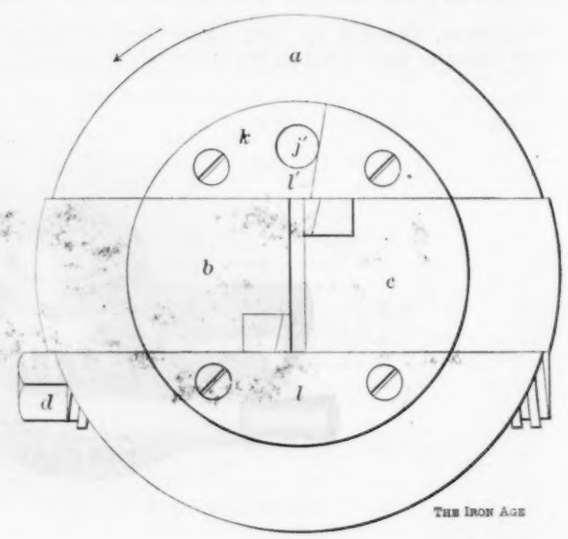


Fig. 12.—*End View of Milling Tool on Line* 2 2 *of Fig.* 10.

THE PRATT & WHITNEY SCREW MACHINE ADAPTED FOR KEY WORK.

it the end of June. Most of the increase has been in hematite for steel making. For ordinary Cleveland iron the output seems to be still rather in excess of requirements, since Germany has ceased to buy, and Cleveland would be badly off but for the requirements of Scotch founders. At present Cleveland foundry iron is coming into Scotland at the rate of about 1000 tons per day. Judging by your statistics there is not much prospect of American pig iron coming over here in any quantity for some time to come, but more foundry iron may come from Nova Scotia, and some hematite iron is coming from Germany. We have also lately had a few thousand tons from Bilbao, Spain—not by any means a new experience, as some commentators on the recent imports seem to think. It is not, however, of a very satisfactory quality.

Scotch builders are still troubled with dear fuel, the price of splint coal suitable for the blast furnaces being now 8 shillings 6 pence per ton at the pits. This is too high in relation both to the conditions of the iron trade and to the general condition of the coal market, but the supply of this fuel is in very poor hands, and our smelters have no recourse so long as they smelt with coal. I am not able to cite corroborative figures, but I am under the impression that Scotch smelters are now paying more for fuel per ton of iron produced than any other smelters in any part of the kingdom. The coal market, however, is exhibiting distinct signs of fatigue. The strike of Belgian miners and the reported intention of the French miners to declare a general strike on November 1 filled our coalmasters with hope of a nice little run of export demand. But while I write it looks as if both these strikes will fizzle out without affecting the situation at all. Meanwhile the Baltic shipping season is drawing to a close, and no new orders are coming in from any quarter; at all events not in sufficient volume to replace the contracts that are being worked off. Prices of export qualities have declined in Cardiff and Newcastle, and Scotland must follow suit. A drooping market just on the eve of winter does not look healthy for either coal owners or colliers, but the industrial consumer begins to have better hopes for the future when he sees coal on the down grade.

The rivet, bolt and nut combination, of which I gave details on its formation last year, has just issued its first balance sheet. It shows a profit on the year of 52,103 pounds, from which 12,435 pounds is taken for depreciation. After payment of preference dividends there remains 32,000 pounds, out of which 5000 pounds is placed to reserve fund, 1462 pounds for formation expenses, 4334 for interest to venders on their cash balances and 16,500 pounds is divided among ordinary shares at the rate of 6 per cent. per annum. This leaves a balance of 4800 pounds to be carried forward. The results seem fair enough for a start, but the combination did not in the past year feel the full effect of the action of the shipbuilders, who united to put up works of their own. B. T.

The shipbuilding industry in the United States, exclusive of the United States Navy Yard, according to a preliminary report of the Census Bureau, just issued, had a total invested capital of $76,699,651 in 1900. This is an increase of 181 per cent. since 1890. The value of products, including custom work and repairing, was $73,444,753, an increase of almost 93 per cent. There were 1083 establishments and 46,121 wage earners, with total wages of $24,388,109; miscellaneous expenses, $3,582,257, and cost of materials used was $33,031,280.

The Morgan Line steamer "El Alba" was launched at Newport News on the 2d inst. She is the twelfth of the Morgan ships to be built there, at a cost of $600,000 each. The vessel is 404 feet long, and has a displacement of 6000 tons; her gross tonnage, 4665; net, 2905; breadth, 48 feet; depth, 33¾ feet.

The New York Aluminum Company of 142 Worth street, New York, announce that they have bought the stock, factory and warerooms of Reymond & Gottlob, formerly at 831 Broadway and 109 Fulton street.

Russia and America in the Far East.—II.

BY ALEXANDER HUME FORD.

By far the larger part of our export to Asia eventually finds its way to the Pecheeli Gulf ports and that part of China under Russian influence, yet we have no direct line of steamers from our Pacific coast to any part of the Asiatic continent north of Shanghai. Here Chinese junks take their diminutive cargoes and carry our products to northern waters, in which our flag, familiar 20 years ago, is now forgotten, yet our trade with this portion of the world, at the beginning of the Boxer outbreak, was increasing by leaps and bounds, and even now promises to become greater than ever before.

The eight steamship companies sending boats from the Pacific coast of North America to Asia make Kobe on the Inland Sea, Nagasaki, at the southern end of Japan, and Shanghai, their principal way ports of call. At one of these points is transhipped every ton of American material for Northern China not sent by the direct New York-Vladivostok line.

From Nagasaki or Kobe it is 700 miles to either Port Arthur or Vladivostok, Russia's two Pacific seaports and Trans-Siberian Railway terminals, situated as they are at either end of the rainbow like line of railroad through Manchuria.

It would seem that Fusan, Korea, just 40 miles beyond the straits of Shiminiseki, through which passes every American ship trading with Northern China and Japan, should be the principal port of distribution for all Northern Asia. Although directly in the pathway of all traffic Fusan is not even a stopping place for one of our steamers. Nearby, however, Russia has secured harbor privileges, and if her projected plans are carried out it is more than probable that here will be located the permanent terminus of the Trans-Asian Railway and the greatest commercial city of the Far East.

With England, Germany, France, Japan and Russia each seeking to extend its sphere of influence, Asia promises to become the chief theater of action during the twentieth century, and it is not conceivable to a rational mind that America, after the sacrifices she is making, will forego the advantages which she has a right to expect, without a struggle.

Statisticians have proved to their satisfaction that before the first quarter of the new century has ended New York will have a greater population than London. Before that time the steady increase of the commerce of the Pacific, now valued at $5,000,000 annually, will in all probability far exceed that of the Atlantic. Seattle, Portland and San Francisco will have become the great American seaports, and the swift ocean greyhounds, even now building, larger far than any ships upon the Atlantic, will swarm the Pacific waters, upon the borders of which must spring the great cities of the future. Vladivostok, New Chwang, Hong Kong and Manila seem destined in the twentieth century to be drawn nearer to our western coast than London now is to New York.

The value of the commerce of Asia and Oceania, still in its infancy, amounts to $2,000,000,000 annually. Of this our share is but $150,000,000, although we, of all nations, are best equipped to supply almost every need and requirement of this market, which we have so long neglected. But suddenly there has arisen in Far Eastern waters a great American metropolis, Manila, second only to Hong Kong as a port of entry, and superior as a commanding strategic base, both from a commercial and military standpoint.

America's Commercial Base in the Pacific.

With this new base, midway between America and Africa, Siberia and Australia, dominating the richest portion of China and the entrance to the Indian Ocean, its conquest has made America for once and all a member of the quartette of great Powers destined to control and divide the world among themselves, and will compel the laying of cables across the Pacific, the cutting of one or more canals connecting the two great oceans, and the building up of an American merchant marine.

With the completion of the Nicaragua Canal the commerce of the Pacific becomes the heritage of America. Our newly established steamship lines to Manila will no longer have to traverse two-thirds of the distance around the globe from New York to reach our Asiatic possessions, nor will the Japanese steamers, now calling at our Southern ports, be so handicapped that the cotton of India can compete with ours, even in India itself; while the great consuming hordes of Asia will be brought nearer to every mile of our eastern and western coast than they now are to the markets of Europe.

It has been ably argued that the Philippines will never be worth to us what they have cost, and it is pointed out that even with 65,000 soldiers in Luzon, whose needs are largely supplied from our home markets, the value of our exports to Manila for the closing year of the nineteenth century has arisen to but $3,000,000, a scant 6 per cent. interest on the annual cost of maintaining the army of occupation, while the prolongation of the campaign for seven years would create a war debt on which the interest at 3 per cent. would amount to over $10,000,000 a year, which is at present more than the entire value of our commerce with the island, and about one-third the value of the total annual trade of the Philippines. It is true that Great Britain, after more than a century of successful colonizing, can sell to her Asiatic subjects per capita but a scant 70 cents' worth of her products annually. With a population in our new possessions of something over 7,000,000 we might, therefore, in time easily look for a market for our goods to the value of some $5,000,000 a year, being convicted, as we are, to the open door policy in Asia. Should we, however, follow the example of Holland toward her colonies, and exclude all foreign commerce, it is very certain that we could make the Philippines and our army pay fully half the present annual cost of occupying the islands.

These are the pessimistic views usually expressed; optimists, however, see in the future a marvelous commercial development; our keen eyed but cautious capitalist pouring untold treasures into new industrial enterprises, and the lazy, enervated natives, overcoming climatic drawbacks, a hard working, prosperous people, competing as mechanics and factory hands, with energetic Japan, for the commerce of China and India. In fact, they expect a race of people (under our tutelage, of course), not 1 per cent. of whom can now read or write, to suddenly develop a trade of $32,000,000 annually, to ten times that figure, a feat which took marvelous Japan, with her centuries of industry and civilization behind her, more than a quarter of a century to accomplish, and that, too, with a population five times greater than that of our Philippines.

Somewhere between the fears of the pessimist and the hopes of the optimist lies the real future of the Philippines. The natives are lazy, as a matter of course, but they may yet be supplanted by the industrious, peace loving Chinese, who can live, work and thrive in any climate, enriching, as they do, with their enterprise, Siberia in the north and the Straits Settlements in the south, excluded for the present from the Philippines, after being mainly responsible for whatever real development has been wrought there.

Advantages of Manila.

While Manila is a tropical city, it is far cooler than the deadly Sargon of the French, Singapore of the English, or even Hong Kong, the thermometer at Manila rarely going above 85 degrees F., even in summer. It is as a base of commercial operations that the Philippines will always prove themselves most valuable to us. Hong Kong made England mistress of the Pacific for generations, and now that we begin to dispute that proud title with her, Manila is indispensable.

In the direct path of our Pacific Coast steamers to Hong Kong, Singapore and India, and a stopping place for our Atlantic fleet bound for Japan and Siberian ports, Manila is destined to play a most important part in our contest for commercial supremacy in the Far East.

As Japan and her dependency, Formosa, strategically dominate North China, so the Philippines bring within our sphere of influence all that part of the Celestial Kingdom from Amoy south to Tonking; but in Indo-China, France, by her exclusive policy, nullifies for hundreds of miles our splendid position. Again we dominate the Malay Peninsula, our Consul at Singapore having but recently resigned his office to operate a line of American steamships between Singapore, Manila and British North Borneo; for, unfortunately, the islands between, Java and Sumatra, the richest markets in the Orient, are hermetically closed by Holland against our commerce. Even beyond the Straits of Malacca, in the Indian Ocean, where we have hitherto been lamentably weak, our influence is now to be felt.

So far, the Boers have been better customers than the millions of India. South Africa consumes $20,000,000 worth of our products annually, sending us little in return; but with the building of the Nicaragua Canal the ships now carrying our products to Cape Colony, instead of having to go on to Sumatra, where our products are excluded, for a return cargo, will find it shorter to return home via India, the Philippines and Manila, than by way of the Suez as at present, so that regular round the world lines of steamships promise to be one of the common incidents of twentieth century ocean commerce.

Should we permit the cane and beet sugar of our colonies to compete with the Louisiana and Kansas industries, Manila, not Batavia, would rule the sugar market of the Far East, and swarm with American bound ships.

It is but 600 miles from Manila to Hong Kong. A hundred miles further, at Canton, American influence again becomes dominant, for at this latter point begins the American railway, which is to run northward for 700 miles, through the richest and most populous portion of China, to Hankau on the Yangtse Kiang, where Russian and American interests dominate.

Shanghai, at the mouth of the Yangtse Kiang River, is more than 1200 miles from Manila, and less than 500 miles from Nagasaki and our industrial rivals, the Japanese; so that it is more than probable that the American railroad will figure largely in our struggle for a commercial foothold in the Yangtse Valley. From Amoy, 900 miles from Manila, to Singapore, 1400 miles distant, our Pacific base should control the field, although Japan is exhausting every resource to extend a partly completed railway along the entire western coast of Formosa, hoping thus to hasten the day when the province of Fukien opposite, with its 25,000,000 consumers, will become her chief market, and its only seaport, Amoy, a Japanese port of distribution. But as the heat of the tropics is even more injurious in its effects upon the sturdy little Japanese than upon ourselves, much of the importance of Formosa as a commercial base and rival for supremacy is discounted.

Our Rivals for Asiatic Markets.

Japan has already shown her ability to successfully compete with our manufactures in the open market of China, and if in the final settlement of spheres of influence all that part of China south of Canton falls to France, we may expect the French to at once renounce their love for the American doctrine of an "open door" in China, and our products will be promptly shut out of a market containing 80,000,000 consumers.

Before the Spanish conquest of the Philippines there was a large trade carried on between those islands and China, and even now the combined trade of America and the Philippines with Hong Kong exceeds that of England with her chief colonial city of the Far East.

The West River, recently opened up to commerce, is second in volume only to the mighty Yangtse Kiang. For hundreds of miles in a direct line westward it opens up Southern China as an American field for future commerce, while from Canton, near its mouth, the American railroad has been surveyed northward to Hankau. In this triangle, formed by the river and railroad, containing nearly 200,000,000 possible consumers, it would seem America's greatest sphere of influence in China is to be marked out. With Manila as its apex the base would

be distant but 1500 miles, half of which distance, from the Philippines to Canton, is an ocean highway, which, in time, will be traveled by regular lines of American steamers connecting with our Yankee railroad to the north, and American river steamers on the West River.

The importance of this stream as a highway of traffic can scarcely be overestimated when it is remembered that a few years after the introduction of American steamers on the Lower Yangtse Kiang the traffic of that river between Hankau and Shanghai increased from $500,000 in value to its present enormous total of $100,000,000. Owing to the primitive methods of overland travel and the infamous system of inland taxes imposed every few miles on goods under transport, it is still a hundred times cheaper to send all produce by water, there being 20,000 miles of rivers and canals gridironing the Celestial Empire; but with the opening of the numerous railways now being constructed in China the productive and consumptive powers of the nation should be increased a hundredfold.

From the terminus of the American road the French will build to Tonking, and on to Yunnan, in Western China, where the British Burmah Railroad from Rangoon will meet it. From Canton the English will build a continuation of the American line to Hong Kong, possibly extending it northward along the coast to meet the railroad now under construction from Shanghai southward to Wenchow, thus forming two trunk lines from Peking to Hong Kong, and connecting all Europe with India by rail, via the now almost completed Trans-Siberian system.

Anglo-American Concessions in China.

England holds another concession of interest to American commerce. It is for a railroad from Wuchow, just beyond Canton, northwesterly to Sinchow, at the head of the navigable Yangtse Kiang. This system of railroads centering at Canton will tend to develop a territory containing more than half the population of China, all of which is directly tributary to our Pacific base at Manila.

All through Central and Southern China both English and Americans have received valuable mining concessions, and the country is fairly well known to our experts. How much the granting of these concessions had to do with the popular uprisings in China against the commercial invasion of the foreigner it is hard to say; certain it is, however, that the Chinese Government invariably exhausted every effort to secure native capital to carry out the suggested improvements before it would grant concessions to the hated foreigners, and then only with the proviso that a large percentage of the shares of each railroad company should be owned by Chinamen, all, in fact, if possible to secure native purchasers. Every railroad is required to maintain a school of engineering, where natives are trained for positions on the railway, which must employ mostly Chinamen, and of the net earnings of every railroad three-tenths go to the Government.

Mining restrictions are even more onerous, although but one-fourth of their net earnings is payable to the Government.

Each nation has repeatedly every advantage to purchase or extort concessions from those dishonest officials at Peking and all through the Empire, who keep the lower classes ground down to starvation point in a land of plenty, forcing families to live on less than 1 cent a day, that the official class may amass fortunes. Bean curd is the main food of millions; coolies purchase a meal of this for the ninth of a cent, and those in the interior consider themselves lucky if they can secure work that will pay them $1 a month. Where modern civilized methods have penetrated, however, wages are being raised rapidly, so that along the lines of completed railways the natives demand and receive fair wages, and are thus enabled to buy our commodities. At Amoy wages have doubled in the last decade; so that instead of powdering their rice cakes with wheat flour the coolies can now afford to eat wheaten bread, so that, while in 1899 we sold 8,000,000 pounds of flour to Amoy, in the last year of the century the city consumed 24,000,000 pounds, despite the troubled times and the fact that Amoy is the only deep water port still owned by China. This is but an indication of the sudden start we have taken toward capturing the southern markets of China. The Chinaman will not purchase unless he can first "look see," so that the advent of our fleet at Hong Kong gave a mighty impetus to our trade with the surrounding country. Milwaukee beer became known, and is now a prime favorite. American canned goods flooded the market, and, if always properly packed, bid fair to monopolize the trade. The Chinese have been made at last to realize that America is a great nation, possessing powerful battle ships, and their respect for us has arisen accordingly, so that now our commerce with Hong Kong is increasing in value at the rate of $1,000,000 a year, bidding fair to displace that of Great Britain there as completely as it has done in the northern provinces, unless, of course, Japan proves successful in underselling us in cotton and other manufactures. In the canned fruit and flour trade we need, however, fear no rival.

Shipping of Hong Kong Exceeds that of New York.

The importance of Hong Kong can be best understood when it is stated that 17,000,000 tons of merchandise enter and leave the port annually, a greater foreign tonnage than that of the port of New York. Over 3,000,000 passengers are landed at Hong Kong during the year, which, in fact, is the great warehouse and commercial center of Southern China, from whence all commodities are distributed. Americans are beginning to build stores and warehouses here and elsewhere in the Celestial Kingdom, but the example of Germany might be followed with advantage. At the treaty ports of China German merchants have erected over 100 warehouses and factories, valued at $30,000,000, while their total investments in China and Japan foot up to $100,000,000.

Since our fleet has become a fixture in far Eastern waters a sudden activity has been evinced by each of the commercial nations, realizing as they do that we enter the far Eastern situation to take from them in open competition, if we can, the trade advantages they have won.

In the last year of the century the German population in China increased from 1043 to 1134, and eight new factories and business houses made their appearance; making a total of 115. Against this, America increased her population in China during the year from 2056 to 2335, and her business houses from 43 to 70, showing a gain in each case more than three times as great as that of Germany, although that nation now has an immense sphere of influence marked out in China. Even Great Britain scarcely exceeds us in the number of new business houses established during the year, the number to her credit being 32 to our 27. However, there are 401 British business houses in China, and 5562 of the Queen's subjects. All foreign nations must give way to Russia, however, in point of general increase of foreign settlements in China proper during the year; her net gain has been 1456, and is increasing rapidly. Even Japan, the most active of all commercial nations in China, has done but half as well, but she has planted 81 new firms in China during the year, or more than the number established in the Celestial Kingdom during the same period by all the other nations of the world combined. That the troubles in China will for a time retard all progress is only too evident, but the reaction that must inevitably come, now that the whole civilized world has awakened to the riches of Kathay, and has shown a determination to protect its citizens and their interests in China at whatever cost.

The Division of China.

Even before the "Boxer" uprising China was practically divided up among the nations. England had exacted a promise from Peking that the Yangtse Valley should never be alienated to any foreign power. Russianized Manchuria and German Shantung had been excluded from the mining regulations. France had forced an understanding regarding the Province of Kwangsi, which adjoins the territory of Tonking; while Japan avowed her intention of eventually occupying Fukien as *quid pro quo* for Port Arthur and Wei-Hai-Wei, to which

China practically consented. In time other nations may withdraw their forces from China, but Russia will always maintain an army in the Celestial Empire. Her vast resources are being poured into the Far East to develop and extend her territory, her agents are now constantly visiting America for the purpose of borrowing new funds for the carrying on of her Asiatic improvements and to purchase the material from us with which to effect them. Already Russia's welcome hand is stretched out to meet our engineers on the banks of the Yangtse Kiang. Free trade England raises no barriers to either commercial Russia or America entering her sphere of influence in China, although her merchants grow more and more wroth as they find themselves ousted by Russian forces, as at Hankau, or driven out by American competition, as at New Chwang and other Russianized Chinese treaty ports.

If we are not interested in the final disposition of China, then no nation is. Controlling as we do the trade of North China, and with the trade of the south opening up to us the greatest possible market the world has yet known, it would be commercial suicide for us to recede from the advance we are already making. The possession of the Philippines is a title deed to the trade of South China. With an open door no European nation can compete with us, and the dawning of the twentieth century finds us at last in a position to enforce our demands to equal rights in China with every other nation. With our expansion policy thoroughly indorsed at home, what else is there left for us to do but join the "Pirate Powers," and insist upon our share in the looting of Asia? Russia offers no opposition, although her servants in the Far East were most bitter in their criticism of our seizure of the Philippines, one officer aboard a Russian man-of-war going so far as to inform me a year after the event of May 1 that Imperial countries, such as England, Germany and Russia, could, with impunity, seize territory and arbitrarily govern alien people, but for America to do such a thing was rank hypocrisy. This from a Russian diplomat!

Alan Wood Company Improvements.—A short time ago it was announced that the Alan Wood Company of Conshohocken, Pa., had purchased property adjoining their plant and would immediately erect a $1,000,000 steel plant. We are informed by President Howard Wood of the company that this plan has been abandoned, but that the new works would be erected in Plymouth township, which is just outside of Conshohocken. Work will be commenced immediately on this site for the erection of a 400-ton open hearth steel plant, consisting of five 50-ton furnaces. Four of these furnaces will be used continuously, producing two heats a day, and one will be a "spare" furnace. Plans are now being prepared and the works will be erected as soon as the material can be delivered on the ground. It is expected that they will be in operation in the fall or winter of next year. The location is such that material can be received and the finished product shipped over either the Pennsylvania or the Reading railroad. The company have purchased property adjoining their present plant and it is expected that the iron mills there will be enlarged next year.

The Reading Iron Company's New Forge.—The old steam forge on North Eighth street, Reading, Pa., owned and operated by the Reading Iron Company, has been abandoned and will be demolished. It was built in 1850, and its 10-ton single acting steam hammer was for many years the largest hammer in the country. During the War of the Rebellion many forgings were made there for gunboats, &c., for the United States Government. The Reading Iron Company have erected and put in operation an entirely new forge on a large plot of ground adjoining their Ninth street rolling mills. The main building is 500 x 100 feet, and is equipped with one 15-ton, one 6-ton, one 5-ton, one 3-ton and several small steam hammers, all double acting. Each hammer is served with two pneumatic hydraulic jib cranes, and an electric traveling crane of 50 tons capacity runs the full length of the building. The finishing department is equipped with the heaviest and most modern machine tools, and no expense has been spared to make this plant as efficient and up to date as possible. Its capacity is about three times as large as that of the old forge. Geo. Schuhmann is general superintendent.

End of the Pan-American Exposition.

The Pan-American Exposition at Buffalo ended on the 2d inst. at midnight, when President John G. Milburn pressed an electric button and the lights in the electric tower grew dim for the last time. A corps of buglers standing in the tower sounded "taps," and one of the glories of the exposition, the electrical illumination, passed away, and the exposition was ended.

The exposition has not been a financial success, but the benefits derived from it will be of great value to the commercial interests of the country. The primary object of the exposition was to advance the friendly relations and commercial intercourse between the United States and the other countries of the two Americas. In this respect it has been a decided success. The republics of Central and South America, Mexico, and the Dominion of Canada responded heartily to the suggestion of an all-American exposition, and sent to Buffalo a collection of exhibits seldom, if ever, before equaled.

The financial loss, it is said, will be in the neighborhood of $3,000,000. The statement to be issued by the officers of the exposition setting forth the expenditures and receipts will be made public some time this month.

The loss will fall upon the holders of the common stock, the holders of second mortgage bonds, and the contractors who erected the buildings. Two hundred and ten thousand shares of common stock were sold at $10 a share. The stock was subscribed for by the citizens of Buffalo and the Niagara frontier in small lots of from one share to 100, so that this loss of $2,100,000 will not be seriously felt. The first-mortgage bonds, amounting to $2,500,000, will be paid in full. An issue of $500,000 second mortgage bonds is unprovided for, but the revenue from salvage on the buildings and from other sources will probably cover a part of this indebtedness. The balance due to contractors is not definitely known, but it is said that it represents their profits for the work done, and no one will be seriously embarrassed by the loss.

The total number of admissions for the six months was close to 8,000,000. The great snowstorm of last April was a severe blow to the exposition, and the formal opening of the exposition was postponed until May 20. The death of the President was another blow to the Pan-American. The attendance had been increasing steadily up to the date of the assassination of President McKinley. The gates were closed for two days, and when they reopened there was a drop of 12 per cent. in the attendance and no improvement followed.

The Government exhibit will be at once shipped to Charleston.

Building Brick from Cinder.—The Brier Hill Iron & Coal Company, at Youngstown, Ohio, manufacturers of Brier Hill Portland cement, have placed a contract with the William Tod Company of that city for an engine for a new brick works. A modern dry press machine, to be built by Chisholm, Boyd & White, Chicago, will be placed in the works and will enable the concern to make about 20,000 brick a day. It is the intention of the Brier Hill Iron and Coal Company to make brick out of blast furnace cinder. The business, as yet, is in an experimental stage. It is the idea, however, to equip a plant capable of turning out 10,000 brick per day that will compare very favorably with any $14 to $16 brick now on the market. The color will be gray and all brick will be uniform in shape and size, with well defined edges. As these brick require no burning, they will be ready for shipment in 48 hours after they leave the press.

The Aultman Car Hauls and Retarders.

The machinery for the car hauls and retarders built by the Aultman Company of Canton, Ohio, includes two strands of heavy chain, one for the haul up chain, the other, somewhat lighter, for the retarding chain. These chains carry spurs, or car pull attachments, at intervals to engage with the car axle, if the bottom construction of the car is such as to sufficiently expose the axle. When the axle is not available by reason of construction or the requirements of very heavy duty, a suitable member is affixed to the bottom of the car. The two chains are led over sprocket wheels at the head and foot of the incline. Both chains are connected through their separate gears and pinion shafts to the same countershaft. This utilizes much of the power developed by the down going empty cars.

Fig. 1.—Car Haul at Coal Tipple.

Fig. 1 illustrates a car haul and retarder erected by the company, in connection with a complete coal tipple of 800 tons daily capacity, at the Magnolia, Ohio, plant of the National Fire Proofing Company. Loaded cars weighing 4500 pounds gross are taken from the mouth of the slope to the tipple at the rate of three cars per minute. The chain used on the up haul is the Aultman No. 126 forged steel Jumbo type. The car pull attachments are carried on rollers, and are 16 feet between centers. The haul up chain travels 60 feet per minute. Empty cars are returned from the tipple to the mouth of the slope by the retarding chain. This is an Aultman No. 206 steel bar chain. The retarding spurs are 12 feet between centers, and the chain speed is 100 feet per minute. Both haul up and retarding chains are led over knuckle or supplementary head wheels at the top of the incline, to provide a suitable grade for discharging loaded cars and taking on empty cars without shock or jar to either car or machinery. The length of the

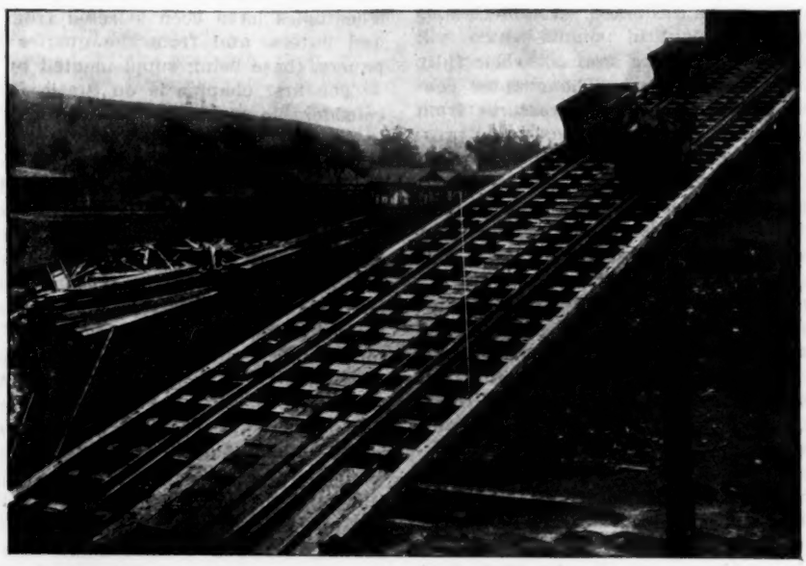


Fig. 2.—Car Haul, 3000 Tons Daily Capacity.

THE AULTMAN CAR HAULS AND RETARDERS.

haul between centers of head and foot shafts is 78 feet. The angle of inclination is 22 degrees. Power to drive the car haul is transmitted by one ⅝-inch wire rope from a line shaft at right angles 250 feet distant. A pawl and ratchet safety on the head shaft provides for contingencies in the case of breaking belts.

The second engraving illustrates a car haul and retarder erected in connection with a complete coal tipple of 3000 tons daily capacity, at Meadowlands, Pa., for the Meadowlands Coal Company. This car haul and re-

tarder is 178 feet long, the angle being 20 degrees. Loaded cars weighing 6000 pounds gross are taken up the incline at a speed of 70 feet per minute. The empty cars are returned to the mouth of the slope at a speed of 100 feet per minute. In point of general design, this haul is very similar to the one illustrated by Fig. 1, but owing to the much heavier duty exacted all parts are more massive. The factor of safety in each car haul is ten. The chains used are the Aultman Nos. 128 and 126 steel forged Jumbo types. The articulating surfaces of these types of chain can be reduced by wear until 30 per cent. of the section is removed, but without impairing the ultimate strength of the chain. A pawl and ratchet safety is used at the head shaft of the haul up chain. This safety also serves the retarding chain, both being connected through their drivers to the same countershaft.

The first cost of car hauls of this type is very moderate, and they solve a frequently difficult problem of obtaining an elevation sufficient for screening and loading coal at locations where the natural conditions do not favor or provide such necessary elevation.

New Publications.

MILL BUILDING CONSTRUCTION. By A. G. Tyrell. The Engineering News Company, Publishers, New York, 1901.

This little book of 40 pages is divided into three chapters, and goes straight to the matter in hand without preface or prefatory note. The first chapter deals with Loads, with paragraphs devoted to roof loads, floor loads, crane loads, snow and wind loads, miscellaneous loads, and a summary. There are two diagrams showing weights of roof trusses. In the summary there is a table giving the weight in pounds per square foot of seven different styles of roof construction. A table showing the weights of merchandise, taken from C. J. H. Woodbury's book on "Fire Protection of Mills," gives 37 items, with weight in pounds per cubic foot, so that pressure on floors sustaining such material in bulk can be estimated. A table is also given which shows the weight in pounds which will come on end wheels of traveling cranes, when fully loaded trolley is at the same end. The chapter concludes with a table giving the normal pressures from wind on roofs of different slopes, for an assumed pressure of 30 pounds per square foot against a vertical plane.

Chapter II deals with General Design, and enumerates some general considerations. Walls and roof trusses, with sketches of seven forms of common roof trusses, are given, followed by remarks on spacing of trusses, jack rafters, and roof coverings, the latter paragraph containing a table showing the least pitch of roof required for various kinds of roof coverings, 12 of which are enumerated. Next come considerations of Truss Connections, Rafters, Bottom Chords, Purlines (with sketch of clip connection between purline and rafter), Unit Stresses, Lighting and Ventilation, and the Estimating of Cost. This latter paragraph contains a very useful table of approximate prices for brick work, rubble masonry, earth excavation, steel beams, sash glazed and painted, pipe railing, corugated iron roof, &c., 37 items in all, covering practically the whole field of ordinary mill construction. We are told that, "Roughly speaking, the cost of one-story buildings complete is, for sheds and storage houses, 40 to 60 cents per square foot of ground; and, for such buildings as machine shops, foundries and electric light plants, that are provided with traveling cranes, the cost is from 60 to 90 cents per square foot of ground covered."

The third chapter is concerned with the Design of Structural Details, and is illustrated throughout. Foundations and anchorage, with table, is the opening paragraph, after which follows ground floor construction, in which the method of making floors of concrete, asphalt and wood, either separately or in combination, is discussed and illustrated. Under the head of Upper Floor Construction the writer gives information on steel trough floors, steel girders and timber floors, with illustrations. The "slow burning wood floor" is a form of construction entirely of wood, the idea being to concentrate the timber into the least number of large pieces, so that a minimum surface will be exposed to the attack of flames. It is based upon the principle exemplified by the fact that books, which are composed of easily enflamed pages, burn most slowly, especially if placed upon shelves where the surface exposed is the least possible. The illustration of a slow burning wooden floor shows joists 10 x 12 inches spaced about 8 feet centers and covered with 5-inch floor planks.

Roof coverings are very fully specified, with tables of size and weight. Among the various kinds may be mentioned slate roofing, asphalt, slag and gravel, corrugated iron, sheet steel, crimped, sheet roll, tin and terne plate, metal shingle, rubber, asbestos, and wood shingle roofing, with a table of comparative cost.

The concluding ten pages are devoted to miscellaneous structural details, well illustrated, and containing numerous useful tables.

Altogether the book contains information of value to the designer and contractor, as well as being useful to the prospective mill owner, or others concerned in the construction, repairs or maintenance of such buildings as are here described.

ELECTRICAL CATECHISM. An Introductory Treatise on Electricity and Its Uses. By Geo. D. Shepardson, M. E., Professor of Electrical Engineering, University of Minnesota. American Electrician, Publishers, New York, 1901. Price, $2.

This work by Professor Shepardson is a handsome cloth bound book of 403 pages. It is written in what is called the catechism form, which is an easy and direct way of imparting information to the practical and busy reader, besides being, with its comprehensive index, an excellent reference dictionary of matters electrical. It contains 1520 questions, and was designed, as the author tells us, to answer the numerous questions which continually come up in the minds of those who come in contact with any application of electricity. The topics have been selected from personal inquiries and letters, and from the queries noted in electrical papers, these being supplemented by many others.

The first chapter is on Static Electricity, to which considerable space has been devoted. The author asks, in one of the questions, "Why should a practical worker learn about static electricity, if it is so little used?" He answers, "Static electricity is dangerous in some cases, and troublesome in many others, and it is very important to know how to avoid it and how to get rid of it. It may also find some more generally useful application." In answering the question "How do Hoepler-Holtz or Wimshurst machines operate?" after giving an outline, the writer refers us for full directions for making simpler ones to the pages of the *American Electrician* of November, 1896, and August, 1897. This is perhaps the one slight defect in the book, as such reference is not always easily made. A reprint of the matter, if embodied in an appendix, would have placed the whole subject before the reader. While speaking of an appendix, we may say that some directions for restoring persons who have been struck by lightning, or accidentally stricken with dynamic electricity, would no doubt be very timely and useful, if embodied in concise form at the end of the book.

The subject of gas lighting by electricity is taken up, and the dangers to be avoided in installations for this purpose are pointed out. The truth about lightning rods is given very clearly, so that he who runs may read.

Chapter II is concerned with Electrical Units. It contains a most comprehensive series of definitions in the answers to 51 questions. This chapter also contains illustrations of the noted workers in the department of electricty, whose names are used in technical nomenclature. Ampere, Volta and Ohm; Watt, Coulomb and Joule; Henry, Maxwell and Gauss are placed with Michael Faraday, who has elsewhere been aptly called the "Father of Electrical Engineering." He solved the problem, "can magnetism be made to set up electric-

ity?" and by the discovery of induced or Faradaic electricity he laid the foundation for the world wide use of the "subtile fluid" for transportation, lighting, heating, and many of the operations now familiar to us in industrial enterprises.

In the third chapter, the Laws of Electric Circuits are stated and explained. The analogy existing between the flow of electricity and the flow of water is neatly epitomized in answer 308, and the pump and the dynamo are constrasted in a way which readily appeals to the understanding and fastens the subject in the memory.

Chapter IV, on Electricity and Heat, explains the relation between the two, and gives the percentage of electricity which by ordinary means may be obtained from a given quantity of heat, liberated in the burning of fuel. The thermopile, galvanometer and pyro-electric generators are explained, together with circuit breakers, lightning arresters and fuses. The use and construction of various forms are given in detail. Blasting fuses, rheostats and heaters are likewise explained, and fully illustrated. The uses made of electricity by the medical profession are touched on in illustrations of cautery electrodes and the electric poultice. Arc and incandescent lamps are dealt with, electric rail welding, the electric furnace, the method of making calcium carbide and carborundum close this most instructive chapter.

Batteries and Electrochemical Action is the subject of Chapter V. The various forms of batteries are taken up, their construction, action and maintenance are explained in detail. Storage or secondary batteries are discussed, and the action of the storage cell is explained, and the difference between primary and secondary batteries is clearly set forth, with explanations of the phenomena peculiar to each.

Chapter VI, Magnetism, lays before the reader the relation between electricity and magnetism. The magnetic field due to current, the sort of field which exists between the poles of a magnet, and the close interrelation between magnetism and electricity is explained. The compass, the components of earth's magnetism, and the magnetometer form the subjects of question and answer, while the principle of so simple and useful an instrument as the magnetic tack hammer is not overlooked. The electromagnet for lifting iron plates, and doing other work in the factory or elsewhere, together with the action of the electromagnetic brake on a motor, close this department of the subject.

In Chapter VII electrical measuring instruments of all kinds are treated.

Chapter VIII is taken up in describing electrical measurements, how to make them and the "why" of the various operations.

In Chapter IX Elementary Motors occupy the attention, the telegraph, telephone and electric bells are all explained.

Direct Current Dynamos in Chapter X opens to the student a study of the elementary form of this class of generators. The winding of the series dynamo, the shunt round dynamo, the compound dynamo, and all that pertains to them are given, and what is of real practical importance to those who have to do with such machines, the derangements which may take place and how to remedy such temporary defects are explained with great minuteness.

Chapter XI enumerates and elucidates Direct Current Motors. Beginning with toys, it proceeds through the whole class up to the railway motor. The measurement of power of a motor by the use of the Prony brake is explained in a practical way for practical men.

Chapter XII, on Alternating Currents, gives a diagram of the circuits from the Niagara power plant, and shows graphically the various uses to which dynamic electricity is now applied. The action of the transformer is made clear, and the several kinds now in use are shown in illustrations among the questions and answers. An elementary two-phase alternator and a three-phase machine are shown in skeleton. The stationary armature of a polyphase alternator is illustrated with appropriate description. Alternators with exciters and rheostats are taken up, and the circuits of polyphase composite alternators also. The book closes with some questions on the composition and resolution of forces.

The book all through contains a vast amount of information which will appeal alike to the practical man in charge of electrical machinery or appliances, as well as to the student who desires a general and comprehensive treatment of the subject.

ENGINEERING STUDIES. Part III. English Stone Arches. By Charles Evan Fowler, Member American Society Civil Engineers. Engineering News Company, Publishers. New York, 1901.

This interesting little work contains eight well executed full page half tones, illustrating as many stone arches in England. The views of these celebrated engineering works are grouped together at the beginning, while the letter press occupies the latter pages. London Bridge, built by Rennie, with its five elliptical arches, is described in some detail. The first arch laid was allowed to stand with the false work in place during the winter following its construction, and when the wedges were struck the arch sank only 1½ inches at the center, the curve not being broken. The bridge, exclusive of land, houses, compensations and law expenses, cost about $2,125,000.

The well known Waterloo Bridge, in London, also designed by John Rennie, was begun in 1811. It is probably one of the most remarkable of English stone arch bridges. There are nine semielliptical arch spans of 120 feet each, with a rise of 34.6 feet. The author points to the fact that the two severely classic Doric columns which are placed on each pier, while beautiful in themselves, are open to the criticism of being misplaced. In describing the Grosvenor Bridge, he quotes Fergusson in this connection, who says: "In all these cases the primary object of the engineer is use, not beauty; but he cannot help occasionally becoming an architect, and sometimes with singular success, though too frequently when he ornaments it is, as architects generally do, by borrowing features from classical or medieval styles, or by some mistaken application of them, betraying how little he has really studied the problem before him."

The Maidenhead Arches, constructed by Brunel in 1837 for railway traffic, are said to be an example of the grandeur which can be given to engineering works by simplicity of design. Mr. Fowler touches upon the question so often asked, why it is that so severe a form of construction as a bridge necessarily must be should blend so artistically and harmoniously with the works of nature? He says: "The prevalence of such a work gives an air of completeness to a landscape, and one has reasonable expectation of seeing other evidences of civilization in the neighborhood, and is not disappointed as the arch seen through the large span forms part of another landscape set in a frame of masonry."

The Kelso Bridge, over the Tweed, with the ruins of Kelso Abbey near by, receives brief notice. This remarkable structure was completed in 1799, and is another of the notable engineering works of Rennie.

The Chatsworth Bridge is almost entirely a piece of architecture, the engineering problems presented in its construction having been very simple. It is, in fact, but one of the accessories of Chatsworth House, which is the most splendid private palace in England.

The Broomielaw Bridge, at Glasgow, designed by Telford, and the New Bridge, at Ayr, the latter made famous by Burns as being one of the "Twa Brigs o' Ayr," come in for descriptive mention. The Grosvenor Bridge over the Dee at Chester, was built from plans by Mr. Harrison, an architect of "quaint curious Chester," and is described as being the fourth largest stone span in existence. The description given is taken from Cresy, and the criticism of the work from an architectural standpoint is a quotation from Fergusson.

This little brochure by Mr. Fowler contains much architectural and engineering information put forward in an interesting and readable form. He points to the beauties and triumphs of the works he presents, rather than to any artistic defects which they may have. His criticisms are, however, fair and impartial, and the re-

sult is a most entertaining and instructive discourse, which leaves the reader's mind alert and ready intelligently to study other similar works of engineering skill, built by a master hand.

LES GRANDS MOTEURS A GAZ ET L'UTILIZATION DES GAZ DE HAUT FOURNEAU (Large Gas Engines and the Utilization of Blast Furnace Gas). By Jules Deschamps. Paris. Published by Veuve Ch. Dunod, 1901.

From an economic point of view no development in the iron industry in recent years merits the attention which the utilization of blast furnace gas for power purposes deserves. In this country we have not gone beyond watching what is being done abroad and preparing for future work. It is characteristic of modern methods how rapidly a voluminous literature has been created on this subject, German engineers particularly having been voluminous writers who have followed very closely on the heels of progress. The latest contribution comes in the form of a volume in French by Jules Deschamps, a consulting engineer of Paris, who takes up the subject methodically. He describes the Thwaite, Meunier and Theisen gas purifying apparatus and the different motors. A large part of the book, however, is taken up with a very elaborate theory of the gas engine.

HANDBUCH DER EISEN UND STAHL GIESSEREI (Manual of Iron and Steel Foundry Practice). By A. Ledebur. Published by B. F. Voight, Leipzig. Third edition.

Professor Ledebur of the School of Mines at Freiberg, Saxony, has long since established his reputation as one of the foremost of writers on foundry practice, and the third edition of his text book, following as it does the second after an interval of nine years, must be greatly modified in order to record the great progress made in the interval. It is hardly necessary to state that the work is characterized by a wide knowledge of the European literature of the subject, and, what is more particularly needed, by a critical study of that flood of crude writing which the industry has been suffering so long. So far as we can judge, Professor Ledebur, however, knows our work in this country only by second hand, a matter for some regret. With that qualification the book is an admirable one, and we are pleased to observe that it deals with such questions as the layout of foundries, of cost accounting, &c., which usually receive scant attention or are wholly ignored in text books which come from the pens of college professors.

The stockholders of the Xylotite Mfg. Company, Cincinnati, Ohio, at their annual meeting held October 26, elected as directors for the ensuing year John H. Hibben, Capt. J. D. Parker, W. J. Overbeck, Dr. A. B. Thrasher, G. E. Shaw, Francis X. Pund, George H. Swift and John A. Hosbrook. The board organized by the election of John H. Hibben as president, W. J. Overbeck secretary, J. D. Parker treasurer and George Swift as general manager. The new factory building is nearing completion. Under the management of George H. Swift the plant is being provided with the most modern machinery and equipment, designed particularly for the manufacture of all kinds of pulleys under the xylotite process invented by G. E. Shaw.

United States Consul Hill of Amsterdam, Holland, reports that the project of draining the Zuider Zee has been withdrawn from the States-General by the new ministry, thus being disposed of probably for a long period. The state of the Dutch budget renders such an undertaking at this time unadvisable; besides, the fall in the price of land has diminished the demand for new agricultural holdings.

The Ozark Zinc Oxide Company of St. Louis, Mo., are building a zinc oxide plant in Joplin, to have an immediate capacity of 3000 tons a year and an ultimate capacity by February 1, 1902, of 5000 tons. The zinc manufactured by the manager, W. F. Gorden, in the oxide mill in West Plains is said to be a very desirable grade, and with the improvements on the new mill the output will be increased materially. The concern will use the large deposits of carbonate zinc ores in the southern part of Missouri and the northern part of Arkansas. W. N. Matthews is president of the company and Claude L. Matthews secretary and treasurer.

The Correct Treatment of Steel.*—I.

BY C. H. RIDSDALE, F.I.C. (MIDDLESBROUGH).

Section 1.—Preliminary Remarks.

The ultimate requirement of steel[1] is that when manufactured it shall in every respect satisfy the purpose for which it is intended and, provided it does this thoroughly, it matters nothing what its composition is or how it has been treated.

If it does not the questions arise, why does it not, who shall take steps to remedy it, and what shall those steps be?

Although we are still far from understanding the causes in detail in every case which may produce a certain condition in steel, much has been learned during the last few years on these questions, but (as one correct principle actually practiced is worth ten reposing in the brains of scientific men) how many of those who handle steel are making full use in practice of what is known as to the effects of various treatment? If not, is it not because our science has not been sufficiently made to face practice, and should not these subjects be discussed more with this in view?

The writer has considered these questions in order to see how our present knowledge, so far as he knew, was or could be applied to practice in different manufactures, and what further investigation was needed next; and he offers the following remarks (though with considerable diffidence) in the hope that, though they reveal no new facts, they may be of interest and of some good if only in showing up some of our deficiencies and limitations. The subject is one in which for years he has always taken the greatest interest and striven to study it impartially; he therefore trusts that, although associated with steel manufacture, he will not be regarded as speaking from a maker's point of view; he is only wishful that the available knowledge may be turned to practical account.

Steel makers have perhaps to consider these questions more, only because if any trouble does occur with the steel before it is finished, it is almost always referred to them.

But where can steel users, wishing to avail themselves of the existing knowledge on the effect that treatment has on steel, find the principles succinctly stated and clearly connected with their application in practice? The literature on the subject is confined to papers which appear scattered over the proceedings of the different societies, the information often being expressed only in scientific terms, and not clearly pushed to a practical issue. Hence the subject is not forced on the notice of men too busy to study and collect all these, and they do not connect them with or apply them to their own practice.

The objects of this paper are therefore:

1. To help those who handle steel by describing in simple practical terms such fixed principles as are known up to date and in what direction they may be applied in practice.

2. To obtain discussion on and information concerning:

a. Various trade processes, and

b. The limitations of the control which maker and user respectively possess over the properties developed by material.

3. To formulate certain views in order to obtain an expression of opinion upon them, in the hope that such as are publicly indorsed by this institute may be henceforward regarded as a standard for makers and users alike to refer to. At present each one sets up his own standard—viz., "exigencies of trade."

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* Paper read before the Iron and Steel Institute, September, 1901.

[1] The writer in the main has in mind soft steel (such as he has dealt with in his previous papers, "Brittleness in Soft Steel," May, 1898, and "Practical Microscopic Analysis," August, 1899), though the remarks apply largely to all steel up to 0.40 per cent. or 0.45 per cent. carbon, and these harder varieties are specially mentioned in places. He does not refer to steel of any one make or process.

The views referred to are:

a. As to the degree of responsibility of maker and user respectively for abnormal results obtained, together with a classified list of the indications that shall be accepted as determining their source.

b. As to certain tests which material ought and ought not to be reasonably expected to stand after given treatment.

The writer, though endeavoring to show by specific instances how, to the best of his belief, the principles may be applied or how certain effects have been brought about in practice, does not intend to imply dogmatically that any given procedure will always produce the same results; each particular case must be considered in conjunction with all the conditions, and these cannot always be maintained constant, so that, though nominally the same, what occurs one time may not another. Even if the suggestions made are in some cases impracticable or incorrect, provided they serve as a starting point and give rise to discussion, some good should result.

have to risk being considered old fashioned and bring-

In describing temperatures the writer fears he will ing down censure on himself from those who advocate exact temperature as measured by a pyrometer for not discarding such "obsolete terms" as "dull red," "cherry red," "yellow heat," &c.[2] Practical men whose eyes are trained by experience know what appearance these give in varying light such as sunshine, or at night, and can gauge them quite as nearly as the temperatures themselves can be regulated.

An ingot furnaceman has to judge the right degree of heating in all sorts of light, day and night, at all times of the year.

We may know what temperatures we want and what is right when we see it, and yet not know the real temperature in degrees centigrade, as we have no means of pyrometrically measuring the temperature of a bloom in the process of rolling.

We cannot fix exactly what the finishing temperature should be, either in degrees centigrade or color temperature, for steel of any given carbon, as besides the mass of the section and cooling facilities, the purpose for which wanted, and hence the degree of rolling hardness most suitable, has to be known.

The simplest and the only proper way is to let the men who have to judge the temperatures in daily practice try pieces at two or three varying temperatures (which they can recognize for themselves), follow them through and make simple mechanical tests, and then adopt the temperature that gives the best results.

A good man will quickly be able to keep to the proper temperatures. A man who cannot is not fit for the job, as he could not either with a pyrometer or if told in terms of color.

Section II.—The Effect that Composition and Initial Treatment Have as Compared With Subsequent Treatment on the Ultimate Properties of the Steel.

A. CONSIDERED GENERALLY, AND WITH REFERENCE TO WHAT IS POSSIBLE.

Composition and all the treatment that an article receives each have an effect on it at some period, but the influences most powerful in determining its final characteristics are frequently the later processes, and these may completely outweigh all others.

It has been usual in the past, and still is in many quarters, to consider that the qualities steel possesses are dependent mainly on its composition, so much so that the term "quality" has become almost synonymous with "composition;" but recently it has become more and more apparent that this is not so, and that, except within narrow limits of treatment, composition plays an insignificant part in insuring given qualities.[3] Selection of the most suitable composition may slightly widen the range of treatment that it will bear and yet give the required results, but it is not possible to produce a steel which is impervious to treatment. The maker controls the initial treatment and the composition, but generally the influence of these is only transmitted a very short distance through the subsequent working up processes, being completely upset on reheating and rerolling;[4] thus in ordinary practice a maker can do very little which will materially affect the steel after working up. Thus unless treatment only had a quite minor effect, say 5 per cent. of the total, or unless the effect of the working up processes was always definite and fixed, and did not vary more than 5 per cent., the maker could not reasonably be held responsible for the subsequent behavior of material, provided it was right when sent out by him.

After it has been further worked, the only way to get an approximately true basis for comparison of the effect of composition in pieces in which it differs is, first, by reheating to redness and letting cool slowly, to remove all hardness which may have been induced by treatment.

As an instance, many years ago, when endeavoring to find whether hard spots in wire were due to local variation in composition (which never was found to an extent exceeding the possible error of analysis), the writer took pieces of 3-16-inch wire rod of soft quality, with carbon 0.10 per cent., manganese 0.40 per cent., hooked them to others of medium hard quality, carbon 0.25 per cent., manganese 0.80 per cent.,[5] and while the end of one was held in a vise, twisted the other. Thus whichever was the mechanically softer was bound to twist more than the other. When the basis of treatment in each case was equal—viz., *a*, tested in the state as received (with the hardening effect of rolling unremoved); *b*, and also after removing the hardening effect by heating as just described, the medium hard wire showed, as would be expected, less twist than the soft wire (about half). But a piece of the soft wire with the hardening effect of rolling unremoved (as in *a*) would twist the chemically harder wire from which the hardening effect of rolling had been removed (as in *b*) through a number of turns, without being itself in the least twisted. That is to say, rolling had imparted greater hardness to the soft wire than an extra 0.15 per cent. of carbon and 0.40 per cent. of manganese, without the hardening effect of rolling, could impart to the harder wire, though it contained altogether double the percentage of hardening bodies that the soft wire did.

In the paper on "Brittleness in Soft Steel" read before this institution in May, 1898, the writer has also described a number of instances where extreme brittleness, practically beyond the bounds of composition for workable steel, and such as even 1½ to 2 per cent. of carbon could not impart to unhardened steel, was induced in steel of eight makes, some exceptionally pure and soft, by treatment only. Indeed, extremes of brittleness in soft steel (such as a bar breaking when falling a few feet on a plated floor) can only be produced by treatment.[6]

There is now ample and conclusive evidence, both from the numerous instances which come under the personal notice of most men having experience with steel and also published, of:

a. The purest and best steel failing when subjected to unsuitable treatment, such as it might meet with in ordinary processes.[7]

b. Steel which, from its composition, would generally be considered bad and impure, standing all prescribed

[2] When used, they are all referred to as seen in a dull light.

[3] See the writer's paper on "Brittleness in Soft Steel," *Journal of the Iron and Steel Institute*, 1898, No. I. The same piece of steel gave various opposite qualities by treatment only.

[4] Coarsely crystalline billet on reheating and rolling yielded fine grained fibrous rods, and fine grained piece of same billet gave coarse grained rods, according to treatment.

[5] The other constituents did not differ.

[6] Yet such a thing happening to a single bar would probably result in the whole lot being condemned. The sooner such brittleness is recognized as being solely the result of treatment by the user the sooner is there a chance of his looking into his own working, locating cause, and thus stopping it.

[7] Stead's paper, "Brittleness in Soft Steel Produced by Annealing," *Journal of the Iron and Steel Institute*, 1898, No. II; Ridsdale's paper, "Brittleness in Soft Steel," *Journal of the Iron and Steel Institute*, 1898, No. I; "Practical Microscopic Analysis," *Journal of the Iron and Steel Institute*, 1899, No. II; Cycle crank which failed, mentioned in present paper, p. 33; Hunt in his paper before the American Institute of Mining Engineers (see *Iron and Coal Trades Review*, June 7, p. 1185) quotes American works which find rails give too soft tests because finished too hot. He also states that chemical composition is secondary to physical treatment; mechanical tests of plates, rails, &c., which give tests contrary to what would be expected from their analysis.

tests and requirements of practice, the treatment evidently having been right.[8]

As further illustrating the question of purity, other countries regularly produce a great deal of steel which is more impure and varies between wider limits than English makers dare supply, but here the users often do not know its composition, and unless treatment causes trouble, it goes through all right the same as purer steel.

American steel often runs up to 0.10 per cent. and even 0.12 per cent. of phosphorus, and if of acid make, to 0.10 per cent. or more of sulphur, while the carbon in soft steel often runs up to 0.15 per cent., or over. An instance was met with quite recently of American soft steel containing carbon 0.24 per cent., phosphorus 0.08 per cent., manganese 0.58 per cent., being used indiscriminately with British soft steel not exceeding 0.10 per cent. carbon and 0.52 per cent. manganese. This is not the only similar instance that has come under the writer's notice.

German steel, too, though some of it is low in carbon, phosphorus and sulphur, also much of it runs up to 0.1 per cent. and 0.14 per cent. phosphorus, as has been freely admitted to the writer and others in German works.

The following are some analyses of soft American and German steels from the records of the writer's laboratory, where most of them were made. They are not selected in any way, but from the date of writing, backward over a period, all have been taken without any omissions:

American.

Carbon. Per cent.	Silicon. Per cent.	Sulphur. Per cent.	Phosphorus. Per cent.	Manganese. Per cent.
*0.14	0.03	0.065	0.13	0.56
*0.17	0.01	0.11	0.05	0.74
†0.09	0.04	0.02	0.13	0.28
†0.09	*nil.*	0.03	0.09	0.37
†0.12	*nil.*	0.12	0.09	0.80
†0.07	*nil.*	0.063	0.15	0.58
0.24	0.02	0.04	0.08	0.58

* These two were being used indiscriminately at one works with English steel containing C 0.09 per cent., Si 0.10 per cent., S 0.08 per cent., P 0.06 per cent., Mn 0.42 per cent. The three analyses were supplied by them.
† All described as "Good."

German.

Carbon. Per cent.	Silicon. Per cent.	Sulphur. Per cent.	Phosphorus. Per cent.	Manganese. Per cent.
0.06	No record.	0.01	0.07	0.32
0.06	"	0.02	0.08	0.37
0.06	"	0.04	0.14	0.43
0.05	"	0.02	0.05	0.20
0.11	"	0.02	0.07	0.32
0.07	"	0.04	0.10	0.32
0.10	"	0.03	0.08	0.40
0.10	"	0.02	0.11	0.40
0.09	"	0.01	0.08	0.58
0.10	"	0.01	0.09	0.60
0.11	"	0.02	0.09	0.66
0.08	"	0.02	0.10	0.46

The foregoing remarks are not an attack on foreign steel, but simply given in illustration of the question at issue.

The fact is, far too much importance has been generally attached to composition *per se*, and far too little to right treatment.

Neither trouble nor expense is spared by makers to give the best composition.[9] In how many works where steel is used is adequate provision made for having the treatment well under command? Would not frequently the least extra trouble (for instance, in turning or stacking bars differently while cooling) be considered sufficient reason for the suggestion to be dismissed at once as not practicable? Yet surely every works ought to have provision for complete control, not only of finishing temperatures, to finish higher or lower at will as required, but also for cooling so as to cool—*a*, equally throughout; *b*, slowly or rapidly.

A difference of 0.02 or 0.03 per cent. of carbon or impurity, more or less, is quite insufficient to have any noticeable effect unless the treatment also differs, in which case it would probably have practically the same effect if there were not the slight difference in composition.

B.—IS THE ORDINARY ROUTINE OF WORKING UP SUCH AS TO MAKE THE BEST OF STEEL, OR IS THERE A TENDENCY TO DETERIORATE IT, AND SOMETIMES SPOIL IT COMPLETELY?

While the heavier articles, such as rails, beams, &c., are generally finished by the steel maker himself, and he thus controls the treatment right through, in the case of the lighter trades, as has already been intimated, he has little or no control, the steel passing out of his hands through that of at least one, and frequently two or more, successive users, each of whom subjects it to some further processes, which soon far outweigh in their effect on the steel the maker's share; and many working up processes tend to make the steel harder or destroy its nature in other ways.

In many cases this treatment is dictated not by how it will affect the material, but by what will give the least possible trouble and cost. Thus it is treated primarily to suit their tools or plant. The men, too, if paid by piecework, give more thought to output than care as to the ultimate condition of the steel. Hence, if a process (such as annealing), formerly considered necessary, can be omitted or output increased in any way, so long as the cost is reduced, no matter whether the treatment to which the steel must submit is more severe or not, this is done, though the treatment involved to attain this may predispose the steel to fail under sudden shock or continued or accentuated vibration or in some other way. In other cases, where the ultimate character of the material is taken into consideration during manufacture, with the intent to give it every chance, the very means taken to provide against injurious effects may be so carried out as to produce them. Annealing in one or other of its forms is perhaps the most common instance of this.

Again, rolled steel for various sections is every day being introduced where other material[10] was used before, and the consumers themselves may not always know exactly what they want. Then there are still works where for the most part wrought iron is rolled, and which only occasionally use steel as a small proportion of the whole. In such cases, where furnaces, reheating temperatures, drafting and strength of rolls, &c., are adapted for iron, there is a strong probability of steel being heated to a higher temperature than it requires on its own account.

Again, the same steel is frequently used for quite different purposes, which may require opposite characteristics.

Considering how much steel does not get the best treatment, the wonder is not that there should occasionally be complaints, but that there are so few, especially in cases in which every inch or so is treated separately and rejected for the slightest defect. Yet it is usual for the steel to receive the blame, and the maker be left to clear himself if he can, instead of the users looking for the fault in their own treatment. The men, especially if paid on output, will not admit that the treatment has varied, and if the maker suggests that this

[8] In the report made in 1900 by the Rails Commission appointed by the Board of Trade, most exhaustive investigations of all kinds with rails which had been in long actual service, some pure and some containing large amounts of impurities—viz.:

	From— Per cent.	To— Per cent.
Carbon	0.291	0.454
Manganese	0.47	1.14
Silicon	0.041	0.207
Sulphur	0.028	0.094
Phosphorus	0.058	0.105
Slag and oxides	0.046	0.098

show that on the whole the harder (impurer) were better than the (purer) softer. Dormus, an Austrian railway engineer, in his "Weitere Studien ueber Schienenstahl," *Zeitschrift des Oesterr. Ingenieur und Architekten Vereines*, 1898, No. 44-48, gives comparisons of a portion of the line which had worn very badly and many of the rails had broken, though they had only been down 11 years and 80,000,000 tons had passed over them, with another portion in which the rails had been in use 20 years and 102,000,000 tons had passed over them, yet they had worn very slightly and not a single rail had broken. The bad rails were fairly low in impurities, the phosphorus averaging 0.07 per cent., while the good ones contained no less than 0.114 to 0.147 per cent. Andrews, in his paper on "The Wear of Rails in Tunnels," read before the Institution of Civil Engineers, 1900, mentions rails with 0.12 per cent. sulphur which had worn very well, as Stead in the discussion pointed out, better than the average life. Brovot, *Stahl und Eisen*, January 15, 1896, gives a number of instances of steel high in phosphorus standing very good mechanical tests.

[9] Both in plant, materials, laboratories with large staffs, &c.
[10] Cast iron, cast steel, malleable castings, wrought iron, &c.

has been so, he is asked to show in dtail how this can be. Therefore the maker, rather than offend his customer, ofter accepts as his fault what he really does not believe to be his. In most instances when trouble arises it affects only a small proportion of the whole—say occasional bars and not a whole cast of 10 tons or upward.

Though generally regarded as indicating irregularity of the steel, this very fact points far more strongly to irregular treatment due to exceptional causes. Composition does not vary materially between one part of a cast and another, except what occurs from the outside of a piece inward, due to segregation, while any variation due to treatment by the maker does not count, as it is obliterated on reheating by the user.

Sometimes samples are analyzed, and if impurity is found 0.01 or 0.02 above 0.06 per cent., or the carbon varying to the same extent from specification, that is regarded as the explanation. Purity is a good thing, but men whose knowledge is more academical than practical are apt to go too far; and to pronounce all steel unfit for use for ordinary purposes which contains more than a total of 0.01 per cent. or 0.02 per cent. of any impurity is misleading.

The idea that the user's treatment is the cause of any unusual behavior in the steel seldom occurs to him, and if he says he "does not care what the composition is so long as it gives good practical results," he means that since the analysis is good the cause must be due in some other way to the maker.

If a maker has made steel really bad in any way the fault manifests itself in his work, and if it does not do so, it is good enough for most purposes.

Section III.—Can the Maker Do More Than at Present, and, on the Other Hand, is It Worth the User's While Troubling to Go Into This Matter and Study the Character of Each Steel to See What He Can Do?

As a rule, if a manufacturer knows exactly what processes the steel will have to go through he can supply a quality which will successfully endure more severe treatment than would be necessary if its nature received due consideration. But frequently he does not know this, while sometimes any information on the subject is jealously guarded. Thus steel, though quite pure, may easily be supplied of unsuitable composition.

As regards composition, it is by no means certain that a still further reduction of the already small quantities of silicon, sulphur and phosphorus usually met with would for most purposes be attended with corresponding advantages, and for the present at any rate it is simpler and cheaper to work to limits of up to 0.08 per cent. for each impurity than to only 0.05 per cent. or 0.06 per cent., greater purity meaning greater expense.

All processes in general use seldom exceed the former, while the latter means more care in the selection of materials and throughout, so that, broadly, greater purity means greater cost. The writer wishes it to be distinctly understood that he is not seeking in the least to advocate impure steel. Makers are constantly trying by all practical means to obtain greater purity and soundness, and for their own sakes not to sail as near the limit as they can in order to minimize the quantity thrown out, since no self respecting maker knowingly sends bad material away. The tendency, therefore, is toward greater purity, and meanwhile it would be wise to take the means that do exist to improve its qualities. As a whole, the steel that is marketed is really very good material, and regularly bears treatment and stands tests such as, to the best of the writer's belief, would not have been thought possible (unless with rare exceptions) say 20 years ago, and which ordinary iron will not stand; [11] and if a quality suited to the requirements were always selected and treated more in harmony with its nature, still better results would be obtained.

Even where, for convenience in keeping stocks, one quality of steel is used for as many different purposes as possible, greater attention to right treatment will often save much trouble and thus practically give more latitude. It is from want of attention to treatment that such anomalies are sometimes met with as that a maker's steel rolled by one user suits a second, but rolled by another user does not, or rolled by a user suits one of his customers but not another. Equally it is no doubt owing to the distinctive characteristics of material being determined mainly by its treatment that such occurrences (as one occasionally hears of) are possible as soft steel being sold as Swedish iron, and Bessemer steel as crucible steel, and giving the purchasers satisfaction.

On the other hand, no matter whose fault it is, when steel is once spoiled it is vexatious, and may lead to strained relations between friends. No one likes to have wasters or to make complaints, and it is to be hoped that many may be willing to look carefully into their own processes and treatment, and see if there is anything in them which can be modified to the advantage of the steel.

Even with our present knowledge of the laws affecting steel, there is in many cases ready to hand a means of vastly improving its ultimate quality, greater than could be hoped for in the direction of composition.

It should not be forgotten when dealing with steels of different makes or types that every steel usually has a character of its own (much as other metals, such as aluminum or copper), and though 0.02 or 0.03 per cent. variation may not matter if the treatment is not trying, the more so the nature of the necessary process is, the more important is it that this character should be studied, and the treatment should be discriminative, being in harmony with the nature of the steel if the best results are to be obtained.

For instance, a steel with

C.	Si.	S.	P.	Mn.
0.09	nil.	0.05	0.06	0.50

will be softer and require less heat than one by another process with

C.	Si.	S.	P.	Mn.
0.15	0.06	0.06	0.06	0.45

Hence to argue that because one stands a certain treatment and the other does not, the latter is unsuitable or at fault, is not fair. Whichever the treatment is adapted to, the other will show to disadvantage.

The right treatment may be just as easy as the wrong, and since the steel industries have an unceasingly hard struggle, and all that affects their welfare becomes a matter of national importance, surely every known means should be used to insure that the steel now available shall be used so as to give the very best results.[12]

Section IV.—The Condition of Steel, and How it is Affected by Work at Different Temperatures.

As a guide to the application of the principles to details of practice in instances other than those shown later on (which are also based on them), and so that we may clearly understand them in their practical bearing, let us follow the main changes which take place in steel, and how they affect its properties while it passes from the molten state until it becomes solid and cold, and *vice versa*, and, avoiding as far as possible the use of scientific terms (and perhaps at the risk of strict accuracy), endeavor to convey the general idea of what for all practical purposes appears to happen.[13]

The Cooling of Steel.

Molten to Critical Point.—When molten steel cools it crystallizes, the pure iron grains[14] settling out, and the

[11] Such faults as seaminess or lamination or deficiencies in bend test which would condemn steel, are cheerfully looked over or not regarded as faults in iron.

[12] Proper treatment should be universal, not exceptional. There can be no question that in cases where it is adopted it pays well for itself. The writer has some marked instances in mind.

[13] In endeavoring to present a fairly continuous outline, which shall embody such principles having a direct bearing on practice as are necessary for comprehending the various conditions produced, the writer has availed himself of such statements by a large number of authorities as appear to best explain them. To quote each one would require too many footnotes. While it must be clearly understood that some of the explanations must necessarily be hypothetical, they are probably substantially correct. The terms "grain" and "cement," being simple and convenient, are used here, but only in a general sense, without reference to any controversial views. "Cement" must not be confounded with cement carbon, Fe_3C.

[14] Which are of such form when uninterfered with as will pack very closely together and require very little binding medium.

more quietly and slowly it cools the larger they are. The last part to set contains more of the carbon and impurities, and may be termed the "cement" which binds the grains together.

If disturbed just as the grains are formed, this cement is still so liquid or soft that they have little or no cohesion, and the material is quite rotten or red-short in the extreme.[15]. At a little lower temperature it becomes cohesive and freely plastic, and it can therefore be readily worked, the cement being so soft that the grains, though cohering enough to permit this, are not held rigidly in their relative positions, but are able to move about each other so easily that they are not themselves appreciably broken up; and if work is stopped while at this temperature, especially if the cooling is slow, the grain is found to be very large and coarse.

In fact, at this temperature the size and shape of the grain is not affected by work, only by the interference and other conditions of cooling, and the piece exhibits no flow lines and has no rolling hardness. The larger the grain, however, the less coherent it is (owing to the larger area of the cleavage planes) if subjected to sudden shock; so the piece is wanting in toughness, and may be actually rotten.

Critical Point.—The point of equal hardness of grain and cement, at or below which change of shape of the mass (by work) begins to affect appreciably the size and shape of the grain.

As the temperature descends, a point is reached at which the cement is approximately no softer than the grains, so they will not so readily move about or flow in it; and when the work applied is sufficiently strong all yields together, and the grain is broken up or elongated, kneaded and interlocked, and the material thus becomes tougher, being dovetailed as well as stuck together. Flow lines became distinct, and rolling hardness begins to be imparted, these effects being less marked if the cooling is very slow.

This has been termed the "critical point,"[16] and is probably for soft steel about 1000 degrees C., say orange or bright red, and lower for higher carbon steel.[17]

Below this point to low red the grain becomes finer and more interlocked, and hence to a certain point the lower the temperature to which it is continued the more work increases toughness of material. At the same time as the temperature decreases the stiffer the binding medium becomes, and the more strongly the grains adhere, and consequently the more they are "broken up" in working, and the more power it takes to make them flow, the lines of flow becoming more clearly defined, and the mass in parts, being already stretched or under tension by the unequal strains set up by the distortion of working, is harder or stiffer.

The higher the temperature below the critical point described, at which work on the piece is finished, not only are the strains set up by working less in the first place, but the longer time it will take to cool, and whether from this, or from its large mass, or any other cause, if its cooling is retarded the strains set up gradually distribute themselves, and are correspondingly diminished or eliminated, and the final rolling hardness is therefore less. If the finishing temperature is lower, this softening effect is, of course, less. Thus to a certain point the hotter the finishing temperature the softer the material, though not necessarily tougher, for if the grain is too large there will be want of toughness. The ideal finishing point is clearly, therefore, that at which these two opposite tendencies are properly balanced.

Below Red Heat.—As work is continued, the relative plasticity of the cementing material to that of the grains becomes rapidly less, until it reaches at

Blue Heat the State of Minimum Plasticity.—Approximately 316-371 degrees C. The grains adhere so strongly that if force is applied to change the shape of the material (whether by work or by the effects of violent expansion or contraction, through sudden or local chilling), it does not uniformly penetrate the mass; internal strains, more or less nearly equal to the extent of its endurance, and which may be termed incipient rupture, are set up,[18] and actual rupture between or in many of the grains[19] frequently occurs, those nearest the surface being sometimes partially detached or loosened.

Thus, although strain applied slowly will often, by forcing parts to stretch which had not previously done so to the full extent of their elastic limit, afford relief and allow the material to bend without rupture, there is always a predisposition for the mass to break under sudden stress or vibration. The temperature, too, from which the piece has to cool is so low that there is little or no opportunity for these strains to be distributed and thus relieved.

Chilling, of course, in all cases accentuates the strains or rolling hardness,[20] but in the case of a piece of steel chilled from near critical point, the initial strains set up by work have been so slight that, though chilling fixes them, the total hardening effect is for soft steel far less than in the case of steel first worked down to a much lower temperature,[21] even if slowly cooled afterward.

Diagram I.[22]

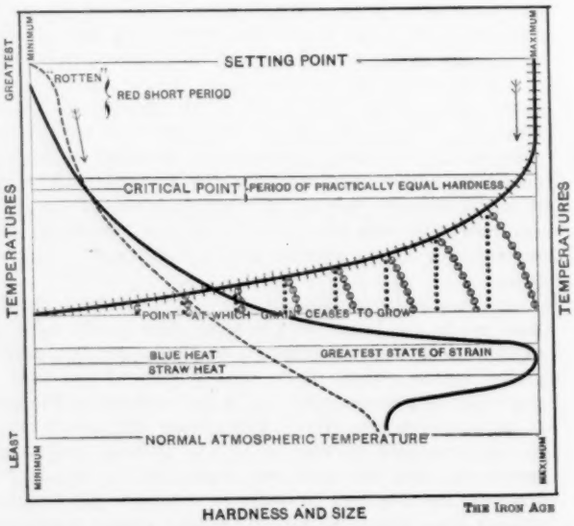
The behavior of steel at different temperatures would seem to suggest the occurrence of the following

CHANGES IN THE "GRAIN" and "CEMENT" WHILE COOLING.

This diagram is not intended as a measure of the changes, but simply to indicate their directions.

HARDNESS or WANT OF PLASTICITY of cement
" " " " grain..
SIZE OF GRAIN as affected by work (normal working) .....
GROWTH OF GRAIN from point at which work ceases till the temperature becomes so low that growth is stopped. The strain at the same time becomes dissipated...[23]
CHILLING at once arrests growth of grain, and, if sufficiently rapid, may break the grain up still further.....[23]

Diagram II.—Hardness and Size.



Though chilling at low temperatures does not harden steel if work has not been continued to these low temperatures, if it has, then chilling fixes the hardness.

[15] Notice how easily, for a second or so after they are made, splashes of steel can be broken up by a bar, but immediately afterward it becomes very tough and difficult to tear apart.

[16] Tchernoff, Brinell, &c.

[17] There appears to be at present no ready means for actually measuring the temperature in degrees centigrade. It cannot be done pyrometically, because a couple cannot be inserted in the piece at the moment of ceasing work. Therefore the eye is the only means of gauging the temperature.

[18] Just as with a piece of thick hot glass or slag suddenly cooled.

[19] Such parts as had been strained or stretched to the extent of their elastic limit.

[20] Both by fixing the strains and setting up new ones due to sudden contraction.

[21] On several occasions pieces of slab rendered so brittle by rolling too cold or chilling at blue heat that they broke off very brittle when cold sheared, on reheating it to cherry redness and chilling in water sheared quite soft, and a plate rolled from such a piece was also quite soft, and stood the most severe bending tests.

[22] From th's diagram it will be clear how the time element acts, since if the "line of growth," even from one of the low temperatures, be continued far enough, it will reach a point as high as that from one of the higher temperatures arrested sooner.

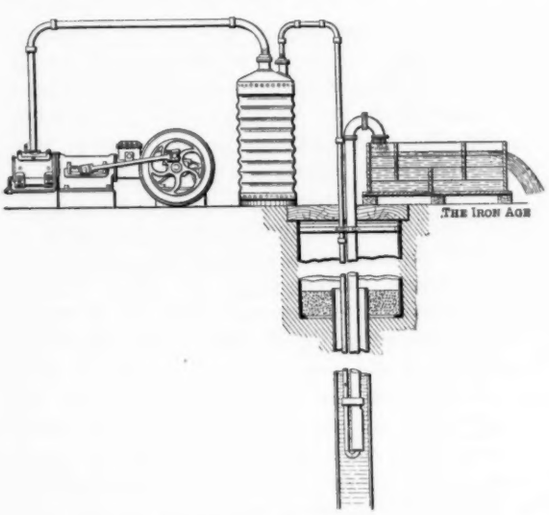
[23] For clearness these lines have not been carried beyond the line indicating the point at which grain ceases to grow. From this they would, of course, continue parallel with the maximum and minimum lines to the line indicating normal atmospheric temperature.

Below Blue Heat.—After the temperature of working gets below straw heat (250 degrees C.), and until it is really cold—*i. e.*, at atmospheric temperature, say 15 degrees C.—steel is more plastic than at a blue heat, though still affected in much the same way if work is sufficiently strong. At still lower temperatures, say below freezing point, it becomes harder again.

From the foregoing we see that toughness depends on cohesion of the grain, and the greater this is the greater the toughness. Want of cohesion at or near the setting point, or at any temperature down to red heat, is termed "red-shortness," Want of cohesion when cold (atmospheric temperature) is called "cold-shortness." Softness is readiness of the grain to change its relative position, and hardness the reverse.

A Large Air Lift Pump.

While our readers are familiar with the principle of the air lift pump, the following description, from the *London Engineer*, will be of interest because of the size



A LARGE AIR LIFT PUMP.

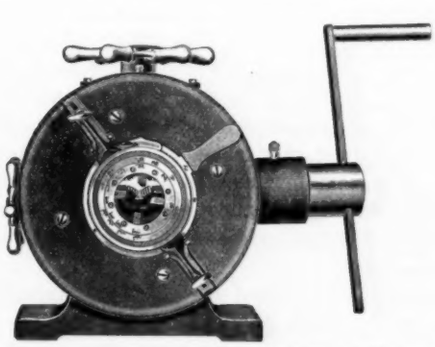
of the plant. A bore hole of the following dimensions was being tested: There was a well 25 feet in depth, lined throughout with a cast iron cylinder. This went down about 1 foot into the chalk, and from here to a depth of 82 feet there was a lining of 24-inch cast iron pipes with shrunk collars and counter shrunk bolts. The bore hole was continued below this with a 23½-inch chisel to a depth of 251 feet 3 inches. The 24-inch pipe stood up 2 feet into the bottom of the 6-foot well, and the bottom of the well was filled up to the level of the top of the 24-inch pipe with concrete. The water rose to within about 5 feet of the surface when standing and sank to a depth of between 28 feet and 30 feet when pumping was going on.

The apparatus used in testing the output of this bore hole consisted of a portable engine of 25 horse-power nominal. A connection was taken off from the boiler of this to the air compressor, but as there was no injector it was necessary to occasionally run the engine of the portable so as to supply the boiler with water. This, of course, was only because the plant was of a temporary and make-shift character, and was highly inefficient; for the engine, being large, naturally absorbed far more energy than would be necessary to simply feed the boiler. The compressor used was of the horizontal two fly wheel type, with the steam and air cylinders arranged tandem. The steam pressure was kept at from 78 to 82 pounds on the square inch. The diameter of both air and steam cylinders was 14 inches and the stroke 16 inches. The compressor was constructed to run at 100 to 120 revolutions a minute. It delivered air into a reservoir constructed of an old corrugated boiler furnace flue with ends riveted to it, and a connection from this was led to the bore hole. Dipping down into the 24-inch bore hole to a depth of 123 feet from the surface was a 7¼-inch rising main. Running down beside it was a 3-inch pipe coming from the air receiver. The bottom of the 7¼-inch pipe was widened out to 8½ inches internal diameter, and by means of two right-angled bends the 3-inch air pipe was turned up into this, projected upward some 2 feet 8 inches from the bottom of the rising main. This was the whole of the apparatus. The rising main delivered into a tank at a hight of some 4 feet from the ground level, so that the total lift was about 34 feet. At the end of the delivery tank, away from the inlet from the rising main, there was a rectangular notch exactly 1 foot wide. As observed by us at a point taken as far back from the weir as possible, the hight of water above the sill of the weir was 9¾ inches. According to Molesworth's tables, this is equal to 156.7 cubic feet per minute—say, 1,400,000 gallons per hour. The air pressure in the receiver started at 50 pounds and decreased while pumping was going on to 39 pounds, at which it kept constant.

Gerald Morris, the chief engineer of the Kent Water Company, has kindly put at our service the details of a rough test he made with this plant when working similarly to when we saw it. The quantity of water lifted was in this instance at the rate of 1,350,000 gallons a day of 24 hours. During a trial lasting 8 hours 20 minutes 14 hundredweight of coke was burned. The actual efficiency arrived at from the compressor to the water pumped was 25½ per cent. The method adopted in arriving at these figures was to take the mean between the pressures of atmospheric air and the air as delivered to the receiver, and multiply it by the length of stroke, the area of the compressor, and the number of revolutions. The possible efficiency of a pump of this class is not high, but the particular value of the system, as well shown in the present instance, is its adaptability, and the absence of working parts in the well itself. Practically everything is above ground, and easy to get at should it go wrong.

The Oster Pipe Threading Machine.

The Oster Mfg. Company of Cleveland, Ohio, are introducing a new pipe threading machine for bench use, and also one for power with hand attachment. The



THE OSTER PIPE THREADING MACHINE.

former, which is here illustrated, has a capacity of ¼ to 2 inch pipe. It has an expanding die head, which is graduated on the face plate. The quick opening dies are controlled instantly by a simple cam movement, without the use of screw driver, wrench or other tool. By the use of an adjustable positive stop the operator is enabled to cut any number of duplicate threads with perfect accuracy. The dies are adjustable to all variations in pipe and fittings. The vise is made to center the pipe perfectly, thereby insuring straight threads. The pipe is drawn up to the dies by hand wheel, rack and pinion.

Founders' Association New York Meeting.—At the Gilsey House, New York, the National Founders' Association will hold their fifth annual convention on Wednesday, November 13, and Thursday, November 14. As the last year has been rather eventful from the viewpoint of the founders, there will be much of interest and importance in the proceedings of the convention.

The Iron Age

New York, Thursday, November 7, 1901.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

The Change in Our Foreign Trade.

The extraordinary domestic demand for iron and steel has brought about conditions which are difficult to realize. For several years our manufacturers have been figuring prominently in the markets of the world. They have not only successfully met competition on common ground in non-producing countries, but have even sold their products to consumers in the very shadow of great European works. So recently has this movement continued on a large scale that the question of how to meet and resist the great American invasion is still agitating the minds of foreign iron and steel manufacturers. A commission sent to this country by the British Iron Trade Association for the purpose of ascertaining the cause of the wonderful progress made here in both cheapening and increasing production has just finished its investigation, and the members are returning to Great Britain this week. Individual manufacturers and engineers from both Great Britain and Germany are still pursuing investigations on the same line on their account. But while this is being done we observe strong indications of a reversal in the movement of trade. Not only are our exports of iron and steel rapidly falling off, but increasing orders are being placed for importation. This is strongly demonstrated by the statistics of our foreign trade for September, which have just been published by the Treasury Department. They show that the value of all iron, steel and machinery exports in September was $7,499,766, as compared with $10,136,931 in the corresponding month last year. The falling off was close to 25 per cent. Turning to imports for the same month it is found that, excluding ore, the value of iron and steel was $1,847,384, as compared with $1,675,653 in the corresponding month last year, showing a gain of about 10 per cent. The next few months are likely to show a still stronger comparison against exports and in favor of imports, in view of the increased contracts going abroad from this country.

The retrograde movement we are now making with regard to foreign trade is disappointing to those who have been boasting of a permanent conquest of the world's iron and steel markets. Nevertheless, it is simply a repetition of past experiences in our industrial history. The American iron trade is subject to momentous changes. If we go back to the depression of 1873 to 1879 it will be recalled by those who were then in business that by 1878 the demand for iron and steel had fallen to such a low ebb that only the best equipped and best located works were able to run, as prices had receded to a level which afforded meager profit even to such concerns. Imports of iron and steel were small and some effort was made to develop an export trade which proved abortive. Foreign markets being also depressed, European manufacturers were easily able to shut us out. As soon as business in this country began to revive in 1879 prices advanced, and although idle works were started rapidly as the opportunity for profitable operation appeared the demand outstripped the capacity of American works and imports increased heavily. Since then the same conditions have been observed on several occasions. Periods of slackened trade in this country have always brought prices down close to the exporting point and checking imports, but a revival of business has just as invariably precipitated a demand in excess of the immediately available productive capacity and imports have increased. In view of the tremendous expansion in American iron and steel output in the past five years, and the ease with which a heavy export trade was handled, it had not been considered likely that any American consumer of iron and steel within reasonable distance of any domestic producing center would ever again be forced to look abroad for a supply. Yet this is the case at present. Not only do we find orders going to Europe for tin plates and sheets, rendered very scarce by the recent labor troubles, but also for steel billets, and it is surmised for steel in more finished forms. These orders are not being captured by foreign makers naming lower prices than our domestic manufacturers, but the cost to consumers is said to be about the same. They are placed abroad for the simple reason that American works are unable to make as prompt delivery as desired, being crowded to their utmost capacity for months.

Diminished exports and increasing imports may therefore be regarded as a manifestation of the great prosperity with which the country is at present blessed. As long as the exuberant prosperity continues we may expect to see this state of our foreign trade maintained. It should not be encouraged, however, by any further rise in domestic prices. Current prices are fairly remunerative and appear to be regarded by consumers as reasonable. If they felt otherwise the demand would be sharply checked. It would serve no good purpose to make further advances, as buyers would then not only feel disinclined to contract for further delivery, but would turn a more willing ear to those who are offering speedy shipments of foreign iron and steel. Our manufacturers should endeavor to encourage consumers to wait until they can be served from domestic sources of supply. They should compel as few as possible to become importers.

American Export Interests.

The remark of the German Emperor that if Germany could not get what she wanted in the way of commercial treaties he would "smash things," was probably misunderstood. It was at first thought to be something like an imperial declaration of the long threatened industrial war against this country, of which we have heard so much of late. It has since been explained as giving formal notice to the agrarian interests of the German Empire that if the result of the protection demanded by them was to close the world's markets to the products of German industry, he would put a stop to the whole foolishness of prohibitory duties on food products and let the farmer take "pot luck" with the manufacturer in good or evil fortune, as might be. This is a reasonable explanation of what at first glance seemed to be a very foolish threat, and would have been if directed against this and other foreign countries. It was not a declaration of war against the young republic which menaces Europe in so many lines, but against the land owning interest of Prussia, which would sacrifice every national interest to its own advantage, and do for the German peasant if it could what the hacienda owners of Mexico have lately done for the peon by their corner in corn.

A war for the resistance of American industrial invasion has long been threatened. It has not created profound consternation in this country, but it has ex-

cited interest, and a great many people are anxious to know if it has begun already, and O. P. Austin, Chief of the United States Bureau of Statistics, has considered it of enough importance to undertake to answer it in a carefully prepared article in the *North American Review*, from which some facts of large general interest may be gathered.

The figures of exports of manufactures from the United States during the first eight months of 1901 show a shrinkage of $36,000,000 in valuation, or 12 per cent., as compared with the corresponding eight months of 1900. In all other classes of exports the showing is perfectly satisfactory. Agricultural products during this period show an increase of some $60,000,000, and mines, forest and fisheries hold their own. Whether the shrinkage in manufactured exports is due to natural and temporary causes or to measures taken to place obstacles in the way of our easy conquest of the world's markets is a question of serious interest to our manufacturers.

Primarily it must be remembered that exports to Hawaii and Porto Rico, which are now customs districts of the United States, do not appear in the export figures for 1901, but did in those of 1900. This reduces the shrinkage to which this inquiry relates from $36,000,000 to about $29,000,000 in values. With this fact in mind the following table may be studied with interest:

Exports of Manufactured Articles from United States, Arranged in the Order of Magnitude in 1901.

Articles.	Eight months ending August 31, 1900.	1901.
Iron and steel	$87,174,209	$69,346,379
Refined mineral oil	46,061,080	42,820,880
Copper	41,830,330	23,181,103
Leather	17,697,762	19,050,852
Cotton goods	15,274,667	16,941,254
Agricultural implements	13,854,774	14,558,166
Chemicals	9,188,129	9,805,136
Cars and carriages	7,334,172	7,643,216
Wood manufactures	7,899,847	7,456,569
Paper and manufactures	4,503,766	4,891,817
Scientific instruments	4,171,561	4,699,376
Paraffin	5,378,651	3,871,077
Tobacco manufactures	4,033,145	3,527,371
Fiber manufactures	2,872,007	3,138,527
Books, maps, &c.	2,044,306	2,268,557
Musical instruments	1,154,564	2,198,197
Starch	1,880,543	2,094,266
India rubber manufactures	1,710,965	1,996,310
Sugar and molasses	1,964,007	1,962,785
Clocks and watches	1,280,226	1,582,286
Glass and glassware	1,336,954	1,449,469
Brass	1,392,916	1,391,976
Paints	1,405,956	1,390,446
Gunpowder, &c.	1,266,059	1,284,473
Marble and stone	1,045,542	1,138,048
Soap	1,148,786	1,035,544
Wool manufactures	886,030	1,018,883
All other	19,196,551	16,110,994
Totals	$304,987,505	$267,853,957

An analysis of the items of the foregoing table will show that the shrinkage is important in only a few items. The only large reductions are in copper, iron and steel and refined mineral oil. In fact, the sum of the shrinkage in these three classifications is greater than the total shrinkage, showing that in other classifications there has been an increase. Why in one or more of these three items the shrinkage has been so important is probably known to most of our readers for whom the subject has interest, but Mr. Austin's official explanation, which we briefly paraphrase, is of sufficient importance to command attention.

Let us take the case of copper first. The effort has been zealously made to create the impression that the depression in the principal consuming industries of Europe, and especially those of Germany, explains the shrinkage of our exports of that metal. We have heard much of the paralysis of electrical development in Germany, &c. Mr. Austin shows, however, that the copper importations of Great Britain, France, Germany, the Netherlands and Belgium, for the year ended June 30, 1901, were only about 5000 tons less than for the year preceding, while during the eight months of 1901 under review the copper exports from the United States to those countries showed a shrinkage of more than that figure. Our exports to Italy, Austria and Russia during the nine months ended with September were 5333 tons, against 7049 tons for the corresponding period of 1900. To France they were 12,155 tons, against 22,798 tons; to England they were 12,643 tons, against 23,790 tons; to Germany they were, for eight months ended with August, 29,950 tons, against 45,110 tons. From this comparison it appears that the decline in copper exports has been: To Italy, Austria and Russia, 1716 tons; to France, 10,643 tons; to England, 11,695 tons; to Germany, 15,160 tons. The total exports of copper pigs, ingots and scrap during the first nine months of 1901 were only 147,040,875 pounds, against total exports of 272,526,368 pounds for the corresponding months of last year, a decrease of 125,458,493 pounds. In a word, half the export trade of the United States in copper has been wiped out within a year.

Exports of iron and steel show a shrinkage all along the line. An analysis of the figures, however, shows that this is expressed in values rather than in quantities. The range of prices during the eight months of 1901 was materially lower than for the corresponding period of 1900. Comparing the average prices of both periods, Mr. Austin finds that iron ore declined from $3.30 to $2.50; pig iron, from $18.90 to $15.10; billets, from $30.60 to $24.80; iron sheets and plates, from 3.1 cents to 2 cents, and so on all along the line. This partially accounts for the shrinkage in the export figures expressed in values, especially with the $7,000,000 of iron and steel exports to Hawaii and Porto Rico deducted. British, German, French and Belgian exports of iron and steel show proportionate shrinkage from the same cause, and here one looks in vain for any evidence that an international boycott is at work against the United States. The shrinkage in quantities of iron and steel exports is clearly attributable to the lessened demand of Europe for iron and steel and their manufactures. It is felt equally in other exporting countries.

In the case of mineral oil, the reduction is wholly in price and not in quantity.

From these figures, for the details of which we refer the reader to Mr. Austin's compilation, a general moral may be drawn which is not devoid of instruction. It chances that the principal shrinkage in our manufactured exports occurs in three lines of business which are most thoroughly controlled by combinations of producers, popularly known as trusts. In one of these lines this control is absolute and complete. We refer to refined mineral oil for illuminating purposes. In another it is less complete, but sufficiently so to dominate the market. We refer to iron and steel. In the third instance we have an ambitious but essentially incomplete control, which has assumed the character of a speculation and sought to artificially sustain prices at a level above the views of conservative buyers at home and abroad, in the face of an inconvenient and burdensome accumulation of the metal in first hands. We refer, of course, to copper. In the industry in which the control of the so-called trust is absolute prices have moved in sympathy with the conditions affecting the market, production has been cheapened steadily and the volume of business has been normally increased at least as fast as the consumptive requirements of the world permitted. In the industry in which the control

of the so-called trust, while not absolute, is sufficient to steady the market and permit prices to decline in obedience to natural laws without shock or excitement, we find that exports are sustained in volume and our foreign markets held. In the case of the industry in which the control of the so-called trust is neither complete nor sufficient for any other purpose than to accumulate a large speculative holding of product with a view to sustaining prices at a level which has stimulated production all over the world, we find our trade shrinking materially in volume and our foreign customers forced into more and more willing dependence upon other than American sources of supply. The moral to be drawn from these facts will no doubt depend somewhat upon the viewpoint of the person who seeks to draw it. Should it assume for the reader the form of a problem in casuistry, we leave him the pleasure of solving it in his own way.

The Movement of Gold.

Gold exports at this time, while anomalous, cannot be regarded as an exhibition of weakness, financially, under the conditions which now prevail—conditions which were reviewed a week ago. Gold is being drawn from the United States because we are relatively strong, and the flow from the strong to the weak is one of the natural currents in the money movement, high and low rates of interest, in reverse order, indicating the centers of high and low pressure. But the present flow from us is something more than a readjustment of interest rates among international markets; in large measure it must be regarded as a corrective movement, but not merely as the liquidation of indebtedness; it is a remedial and a relief measure at once, whether we regard it as voluntary assistance or as a forced contribution to Europe's need.

The last days of October witnessed the export of upward of $3,000,000 gold, and engagements of about $5,000,000 more are reported for shipment by early steamers. The outgo would have been larger, doubtless, had not there been unusually heavy exports of cotton, wheat and flour during the week ended last Saturday. Indeed, the exports of this produce have furnished nearly $23,000,000 of commercial bills during the week, and the exceptional shipments seem to point to an especial design to relieve the situation here by making produce act as gold. So successful has been the effort to stimulate the making of commercial bills, which have been provokingly slow this season, that even the second shipment of gold referred to may be reduced in amount or postponed to a later date.

The exports of cotton, indeed, during the last four days of October and the first two days of November have scarcely, if ever, been equaled during a similar period, and on one day, November 1, the exports were over 108,000 bales, over 60,000 bales of which went to Great Britain and over 21,000 bales to France. The total exports for the season—that is, since September 1—now vary but little from those at the corresponding time last year, when they were 1,493,595 bales. The outgo of wheat, too, was of special significance, the exports for the week ended November 1 being nearly twice as large as during the corresponding weeks in 1900 and 1899, about equal to the outgo in 1898 and second only to the two record breaking weeks experienced in August this year. The exports of wheat flour also have been of interest, the shipments from New Orleans on Friday last being the largest ever made in any one day.

But relief from the strain which gold exports would place upon the banks is obtained from the resumption of bond redemptions by the Government and the import of gold via the Pacific Coast. The more active money market, too, and the higher rates of interest current in New York, are attracting currency from the interior. The prospect, therefore, seems to be that little if any disturbance will accrue from gold exports.

The financial and commercial position of this country is very strong and as our credits mature abroad we will be able to turn the tide strongly in our favor should it seem wise to do so, notwithstanding the debts we contracted in France and which were partially renewed recently. The Bank of England has continued its effort to throw the burden of gold exports to France upon New York, as the raising of the discount rate from 3 to 4 per cent. last week indicates. That England feels the heavy drain of the Boer war—the cost to her up to the present time being estimated at $500,000,000—goes without saying, and the United States has been a large beneficiary of the distribution of this money. With England's heavy burden it is small wonder that the United States has distanced her and now stands the first exporting nation in the world. This position would have been attained by the United States, however, without the Boer war, but the war has hastened the fulfillment.

The Boer war, too, is responsible for the small production of gold in South Africa, gold to the value of only $9,500,000 having been mined there in 1900, against over $73,000,000 in the preceding year, but Australia produced over $74,000,000 worth. The United States, however, still leads the world in the amount of its gold production, over $79,000,000 in 1900. Much of the Klondike gold, too—in fact, nearly all—came and still comes to this country. Thus far this year the receipts have been $21,000,000, and the prospect seems to be that the total output this year will be about $25,000,000, which is about the yield of the mines in that section last year. Not a little of the Australian gold also finds lodgment in this country.

Under these circumstances, then, it is readily seen why we are being called upon to relieve the European pressure for gold, brought about by industrial reverses in Russia, in Germany, in France; by the war ravages in South Africa, its reflection in England and the lack of confidence in European countries born of these conditions.

The shipbuilding industry in the United States, exclusive of the United States navy yards, according to a preliminary report of the Census Bureau, had a total invested capital of $76,699,651 in 1900. This is an increase of 181 per cent. since 1890. The value of products, including custom work and repairing, was $73,444,753, an increase of almost 93 per cent. There were 1083 establishments and 46,121 wage earners, with total wages of $24,388,109; miscellaneous expenses, $3,582,257, and cost of materials used was $33,031,280.

The Shattuck Adding Machine Company have been organized for the purpose of manufacturing the Shattuck adding and listing machines. The company for a few months will have the machines made by contract, but later will build a large plant in Minneapolis, Minn. Their headquarters for the present are with Paul & Hawley, attorneys, Temple Court Building, in this city.

Baker & Co., platinum refiners, of Newark, N. J., are introducing the Tucker combustion apparatus for determining with great accuracy the volatile ingredients and total ash of any organic matter. It may be used to great advantage for the dry distillation of substances.

Notes from Mexico.

The Pan-American Congress.

DURANGO, MEXICO, October 29, 1901.—The second International Congress of the governments upon this hemisphere, represented by their duly accredited delegates, has formally settled down to business according to programme. As an indication of the spirit which animates the body it is worthy of note that before the attending representatives had fairly organized as a deliberative assembly a resolution was offered and unanimously adopted in which the feeling of the congress with respect to the unsettled relations existing between the republics of Colombia and Venezuela was voiced in the declaration that the delegates considered that "harmony between the States represented is indispensable, in order that their work should have the result that is sought." With this preamble the delegates considered it opportune "to address a friendly and deferential word" to the governments of the countries named, conveying the hope that they "may reach an equitable and fraternal adjustment of their present difficulties."

Good results ought to be expected from a body which begins its labors with such judicious and commonsense expressions of its views in regard to the evils of war between kindred peoples.

The European press has predicted that the congress would be a failure.

The local clerical journals have done their utmost to second the endeavors of their foreign brethren. The efforts of both have been directed toward sowing in the minds of the delegates the seeds of suspicion as to the motives of the United States in fostering the Pan-American movement. From all the evidence at hand, and in the opinion of those best qualified to judge upon the spot, these unworthy attempts to wreck a most practical and praiseworthy endeavor to promote commercial and political harmony between the three Americas are doomed to decisive failure. Every delegate in attendance seems to be imbued with a desire to do his part to contribute to the success of the gathering, and to disprove the pessimistic forecasts of the prophets. The opening resolution may be taken as the keynote of this feeling.

Pan-American Exposition Awards.

At the Pan-American Exposition in Buffalo Mexico repeated its success at the Paris Exposition. At the Paris Exposition Mexico carried off 1078 awards for its exhibits. At the Buffalo Pan-American Exposition 78 gold medals, 151 silver and 139 bronze medals were placed to the credit of private and Government exhibits from this country.

Railroad Construction.

There is every reason to believe that the coming year will be one of very active operations in railway construction work. The recent readjustment of the financial affairs of the Mexican National Railway Company has been followed by the announcement that it has been decided by the management to at once carry out the long contemplated intention to change the road from a narrow to standard gauge. Ten million dollars, gold, has been apportioned under the readjustment scheme for this work. A major portion of this sum will be expended in the purchase of material, rails and rolling stock. The construction of an extension to El Salto is also expected to be undertaken at an early day by this company. Among other railway projects more or less definitely counted upon as likely to contribute to the activity of the iron and steel trades in the United States in the coming year may be mentioned a branch from this city to a connection with the Mexican Central Railway at Gutierrez, Zacateca, under a concession granted to Mr. Stilwell, who is now engaged in building a line from Kansas City to Topolobampo, the extension of the Mexican International Railway to the Pacific Coast at Mazatlan, which work was discontinued at the time of the late C. P. Huntington's death, and the inauguration of operations for the construction of the much talked of Pan-American Railway.

Visit of the Mining Engineers.

The coming visit to Mexico of the members of the American Institute of Mining Engineers is looked forward to with interest and pleasure by the English speaking people engaged in the exploitation of Mexico's resources. Preparations have been made for the entertainment of the engineers at the various places which they will visit in their tour, and nothing will be left undone which may contribute to their enjoyment or comfort.

Exchange and the Gold Standard.

The continued high rate of exchange—it has reached within a fraction of 120—has led to a renewal of the rumors in circulation some months ago to the effect that the Government would adopt the gold standard. It is scarcely necessary to say that the report now is as baseless as it was then, no such idea being entertained by those who preside over the republic's finances. Mexico is prospering through, or despite the existing system of currency. Those best qualified to judge consider that it would be detrimental to the country's interests to make any change at this time. J. J. D.

Copper Trading on New York Exchange.

It is authoritatively stated that the Board of Managers of the New York Metal Exchange will meet about the middle of this month, to act on a proposition to establish a contract which will make possible the trading in copper from all parts of the world. At the present time dealings on the New York Metal Exchange have been confined exclusively to lake copper.

The proposition to be submitted to the Board of Managers is to abolish the present copper contract, and substitute the following:

"All bids and offers shall be for 25 tons, or 56,000 pounds, or the multiples thereof, of standard copper.

"Standard copper shall consist of rough or refined copper, not below 96 per cent. For each full 1 per cent. above 96 per cent., 1 per cent. shall be added to the amount upon delivery.

"All deliveries to be made in store New York, and by negotiable warehouse receipt with weigher's return and certificate of analysis attached.

"The copper may be either foreign or domestic. Under such a contract the producer and the consumer can both deal with safety, and it will also be a safe basis for speculative dealings, as the product of the world—about 500,000 tons—stands behind the contract, making a corner impossible."

It is stated that the members of the exchange are unanimously in favor of the proposition, and that it will be adopted at the meeting of the Board next month. After the action of the Board it will be necessary to give ten days' notice before trading can begin under the new plan. It is understood that the members of the exchange are both enthusiastic and hopeful about the matter, and that they believe that ultimately New York, instead of London, will be the center of the world's copper trade.

R. D. Nuttall Company.—The R. D. Nuttall Company of Pittsburgh, manufacturers of cut and planed gearing, are installing a very large amount of new machinery in their works in Pittsburgh, consisting of the latest type of automatic gear cutters, special machinery for spiral gears, racks, Hindley and ordinary worm gearing, lathes, boring mills, &c. The concern are also adding in their power plant one 125 horse-power Westinghouse gas engine, making a total of upward of 500 horse-power used by this concern. The R. D. Nuttall Company have in course of construction a special gear cutter for cutting gears up to 30 feet in diameter and 60-inch face. The additions to equipment named above will about double the already large capacity of the R. D. Nuttall Company for making cut and planed gearing, and have been made necessary by the very rapid expansion of the business of this concern. Their entire plant is working day and night, and the concern have a large amount of orders on hand and are booking new business every day. The officers of the R. D. Nuttall Company are F. A. Estep, president and treasurer; J. R. McGinley, vice-president, and Fred. S. Martin, superintendent of works.

Lake Mining Matters.

DULUTH, MINN., November 3, 1901.—Minnesota mines will have shipped fully 11,000,000 gross tons by the close of the season. Up to November 1 the total had been 10,023,893 tons, as follows: Duluth & Iron Range Railway, 4,802,425; Duluth, Missabe & Northern, 3,135,942; Eastern Minnesota, 2,085,526. This is compared with a total of 8,778,088 tons for the same period last year and 7,081,004 tons for the period in 1899. For the entire season of 1900 the Minnesota shipments were 9,400,000 tons. The shipments of the Duluth & Iron Range road were surprisingly large during October and that road enters the final shipping month with as great a volume of business as had been expected for the year. It will ship nearly 500,000 tons more before the close of the season.

Michigan mines have not equaled this record and will show for the month a decreased output. I still hold, however, to my earlier figures of 20,000,000 tons for the year, which many have lately thought too high.

On the Mesaba the Sharon mine is shipping more heavily, reaching about 1500 tons daily. The mining company and Drake & Stratton are both expecting a busy winter, and the mine will be prepared another spring for an output several times as large as that of this year. Ore explorations that have been conducted for some time at a point southwest of Hibbing have shown an ore body that is at least 215 feet thick and of yet unknown extent. There are shown about 4,000,000 tons of Bessemer and nearly as much more non-Bessemer ore so far, and the exploration is not completed.

The Breitung lands at Negaunee are to be explored at once, orders to that effect having been given. These lands include much in which ore probably exists; in fact ore was found years ago on some portions thereof. These lands include about 1800 acres in and about Negaunee, and the old Davis and Milwaukee mines are on them. Action of the Cleveland Cliffs as to appeals will have no effect upon the commencement of this work. At the new mines of the Cleveland Cliffs Company at Negaunee the machinery is going in. Champion mine is troubled by a cave in that has compelled the office force to move into other buildings. The sinking of shafts at this property is to be a serious matter, as there is a great depth of quicksand, varying from 118 to 265 feet. The drop shaft system of sinking will be adopted and pumps to handle 4000 gallons a minute put in. At the Regent mines of the Oliver Company at Negaunee there are large stock piles that will not be moved this year. The Buffalo part of the mines seems to be almost exhausted.

On the Menominee range the Hope property has accumulated a stock pile of good ore from the second level development and it seems as though the mine was to prove a good one. At the Gibson mine on this range four shafts have been sunk and all are in good ore. The upper level of each shaft was unsatisfactory, and the property would probably have been abandoned had it not been in such hands as those of the Oliver Company and Messrs. Cole and Hulst. They had the knowledge and courage to continue to depth and the property is now assured of importance. It is supposed that a large shaft will be sunk and a new machinery output will be secured.

The Gogebic range has suffered seriously from mine fires. Last week it was the Ashland that lost; now the Aurora and Pabst have been delayed and injured by a fire in No. 2 shaft of the Aurora on the ninth level. The actual damage is not great, as the shaft was little used, but the generated gases may cause considerable delay in adjacent mines, including Pabst and Norrie.

Vermillion production for this year will be in the neighborhood of 2,000,000 tons, a much larger amount than ever before. Every mine of this range is the property of the United States Steel Corporation.

Jas. Gayley, D. M. Clemson and D. G. Kerr of the United States Steel Corporation have been making a tour of inspection of the ranges, accompanied by President T. F. Cole of the ore companies, and are now completing it by an examination of the Chapin, where very important improvements have been made this year. Mr. Gayley said that the probability for 1902 was for increased shipments from Lake Superior over this year, and that the mining and ore transportation business of the first year of the corporation had moved with exceeding smoothness. The shipment of 13,500,000 gross tons of ore will cease this month.

K. Asano, consulting engineer of the leading copper mines of Japan, has been in the Lake Superior iron and copper country this week making an inspection of conditions and methods.

It is said that copper shipments from now to the close of lake navigation will be about 7000 tons, but these figures are probably too high.

The last one of the four amygdaloid shafts at Calumet & Hecla has now been closed, to await, it is claimed, the completion of the new mill. In the mile deep Red Jacket shaft at this mine two-story cages have just been substituted for those formerly in use. This shaft has six compartments, two of which are used for bailing. The mine's October product was the largest in its history and a further increase is looked for.

In the month of October 140 tons of copper from the new Mass mine was received at smelters. This is about 1½ per cent, mineral in the rock treated, which is a high average.

Western mining engineers are to erect upon the Calumet sands a mill to treat the tailings that have been accumulating for many years and are estimated to contain 25,000,000 tons. A mill in many respects similar to that at the Franklin sands is to be built and very elaborate experiments will be carried forward. D. E. W.

No Steel Plant, But Blast Furnace, for Cleveland.

CLEVELAND, OHIO, November 4, 1901.—A report emanating from the East states that a number of men identified with the Wellman-Seaver Engineering Company, the Union Rolling Mill Company and the Oglebay-Norton Company, will build a $2,000,000 steel plant near the plant of the United States Steel Corporation in Cleveland. H. A. Fuller of the Bourne-Fuller Company and S. W. Sessions of Lamson & Sessions were said to be central figures in the enterprise. It was stated that the company would make structural iron and merchant iron and that the gas from the coking plant would be sold to consumers.

When interviewed by a representative of *The Iron Age*, S. T. Wellman of the Wellman-Seaver Engineering Company stated that there was no truth in the report that a company had been organized, or were being organized, so far as he knew, to build a steel plant. He stated that the members of his firm were interested in a project to erect in Cleveland a large blast furnace, and that the gentlemen above mentioned would also be interested. He declined to go into details, stating that the company had not yet been organized, although sufficient capital had been guaranteed to make the project assured. He said that the plant would produce foundry iron and would have a capacity of about 300 tons per day. It is also their intention to make their own coke. The parties interested will hold another meeting in this city the latter part of the week, when more of the details will be settled.

Members of the Oglebay-Norton Company denied any knowledge of a steel plant project.

Pullman car porters are organizing a bank in Chicago. This will be the second bank in the North to be founded by colored men, the first being now in active operation in Philadelphia. The porters maintain an organization named the United Investment Company, who are operating two business ventures in Chicago, one a furnishing store and the other a cigar store and factory.

The last rail of the Manchurian line is stated to have been laid on the 3d inst. at Menduche, completing the great Siberian Railroad from Moscow to Vladivostock.

MANUFACTURING.

Iron and Steel.

The fact that Friend Cox of Moundsville, W. Va., has been employed by the Everson Steel Company, recently organized, to purchase a site in the vicinity of that city, tends to confirm the report that the Everson Steel Company will erect a large basic open hearth steel plant in the Ohio Valley. About 600 acres have been obtained on the Ohio River, about six miles below Moundsville.

The Garrett-Cromwell Engineering Company of Cleveland will prepare plans for the erection near Ensley, Ala., of a large plate mill. William Garrett and W. H. Lash of the company are at present looking over the ground.

It is stated on good authority that the Hartman Steel Company of New Castle, Pa., have purchased the Cuyahoga Steel & Wire Company of Cuyahoga Falls, Ohio. It is understood that the price paid was $500,000, exactly the capital stock of the latter company.

Ground was broken last week for the new plant of the Rolling Mill Company of America, which concern will erect sheet mills at South Connellsville, Pa. Plans are being prepared for the buildings and equipment and contracts will be closed in a short time. George J. Humbert, who built the Humbert works of the American Tin Plate Company, is actively identified with the new company.

The Sheffield Rolling Mill Company, Sheffield, Ala., now have their new steel hoop and cotton tie mill in full operation, and are prepared to make prompt deliveries. They will continue to manufacture iron and steel bars and railroad spikes.

The Sement-Solvay Company, operating 50 by-product coke furnaces at Dunbar, Pa., will build 60 more at the same place. The Sement-Solvay Company have been furnishing the Dunbar Furnace Company with the greater part of the fuel used by their stack for several years. The furnace company will build a new stack next summer, hence the enlargement of the oven plant.

The American Ship Building Company, shipbuilders and engineers, Cleveland, Ohio, have received an order from H. A. and Arthur Hawgood for a 6000-ton steamer, to cost about $260,000. The boat will be built at Lorain, Ohio.

The Sharon Steel Company, Sharon, Pa., have purchased the plants of the Combination Fence Company in Malvern, Kan., and Kansas City, Mo. The plant at Malvern will be dismantled and sent to Kansas City, where the manufacture of the fence will be continued.

General Machinery.

The Loomis & Hart Mfg. Company, Chattanooga, Tenn., will rebuild their saw mill, recently destroyed by fire. The latest and most modern machinery will be installed and the plant lighted by electricity. The cost of rebuilding will be between $10,000 and $12,000, most of which will be spent on new equipment, the orders for which have all been placed.

The American Bicycle Company will enlarge their factory at Toledo, Ohio, by an extension 170 x 45 feet, three stories. Sufficient machinery is on hand for equipping the addition. The company manufacture steam carriages at this plant.

The Narragansett Machine Company, Providence, R. I., have contracted for the boiler and engine plant to be installed in the extension now under way. The improvements to the plant will consist of a main building 160 x 40 feet, two stories, which is to be extended in the spring 100 feet, two stories and basement; a one-story building, 100 x 50 feet, for enameling purposes, and large lumber sheds.

The Colorado Iron Works Company, Denver, Col., builders of ore smelting equipments and milling machinery, have recently closed a contract with the California King Gold Mines Company for a 1000-ton automatic cyanide plant, and are now completing a 1000-ton concentration plant for the Federal Lead Company near Flat River, Mo. The latter plant is equipped with Bartlett tables which take the place of jigs and buddles heretofore used.

John Zahorik, who is building a new machine shop and foundry at Roscoe, N. Y., states that he is in the market for a lathe with 8-foot bed and 24-inch swing.

The Blakeslee Mfg. Company, Birmingham, Ala., have recently erected a new warehouse to meet the increasing demands of their business. It is equipped with the best labor and time saving appliances. They have made carload shipments of their veneer machinery to the following concerns: Federal Match Company, Paterson, N. J.; Farmers' Mfg. Company, Norfolk, Va.; Florida, Havana & Sumatra Company, Quincy, Fla., and the Creamery Package Mfg. Company, Kansas City, Mo.

Among recent foreign shipments of electric traveling cranes made by the Northern Engineering Works of Detroit, Mich., are three electric cranes to Glasgow, one to Brussels, and one to Copenhagen. One foreign firm have ordered their third electric crane of this make.

An extensive new plant will be erected at Buffalo, N. Y., by the American Radiator Company of Detroit, Mich.

The stockholders of the Westinghouse Machine Company of Pittsburgh will hold a special meeting January 7 for the purpose of voting upon a proposition to increase the capital stock of the company from $3,000,000 to $5,000,000. The business of the company in the manufacture of gas and steam engines and the installation of electric and power plants, the construction and equipment of electric railways, and in engineering work generally, has become very extensive.

Modern machinery will be installed in the plant of the R. Tynes Smith Company, at Baltimore, Md., by the American Can Company of 21 State street, New York.

The North Alabama Engineering Company, New Decatur, Ala., have put a new steam hammer in their forging department, also a 10-ton Whiting cupola in foundry, a 500-light dynamo for lighting the works, besides a number of new machines in the machine shop, and have expectations of making further additions in the near future. The line of manufacture to which the company are giving special attention is the building of a heavy duty balance slide valve engine of high grade. Its design is to embrace simplicity, economy and durability, all of which they are assured is fully met. In August they built their first engine, which was for the North Alabama Brick Company, New Decatur. They provided the whole plant excepting the brick machines. Since commencing they have been much occupied in the manufacture of architectural iron work and are making arrangements to manufacture oil drilling outfits to meet demands of the new oil field in the Tennessee Oil Valley, which is in the immediate vicinity of New Decatur.

Thomas P. Conard, 119 South Fourth street, Philadelphia, Pa., reports business in the machinery line quite active during the last month or two. Recent sales are as follows: One 21 x 42 inch duplex air compressor, to the Williams Coal Company, Minersville, Pa.: a pair of 16 x 36 inch hoisting engines and eight large steam boilers, to the Mt. Jessup Coal Company, Winton, Pa.; a pair of 24 x 60 inch Allison first motion hoisting engines, and a pair of 14 x 24 inch geared engines to the St. Clair Coal Company; a pair of 20 x 48 inch hoisting engines to the Buck Run Coal Company; four 150 horse-power boilers to the Enterprise Coal Company, and a similar battery to the Dodson Coal Company; a 30-inch gauge locomotive to Scranton parties; a 36-inch gauge to New Jersey parties. Several lots of relaying rails have been sold to mining and contracting concerns and a number of other large sales are in prospect.

Henry G. Morris, Philadelphia, Pa., has in course of construction a number of air compressors of the D'Aria type for various concerns. One of these with a capacity of 500 cubic feet of free air per minute is building for a mining company in the North of England.

The crane department of the Niles-Bement-Pond Company, Philadelphia, Pa., continues exceedingly busy, with a large amount of work ahead. They have just completed two 120-ton, two 35-ton and one 10-ton crane for the shops of the Philadelphia & Reading Railway Company, Reading, Pa. Recent shipments include one 35-ton crane for the Ridgeway Dynamo & Engine Company, Ridgeway, Pa.; five cranes, each 15 tons capacity, for the American Car & Foundry Company, Detroit, Mich; two cranes, 60 feet span and 20 tons capacity, for the Mare Island Navy Yard, San Francisco, Cal.; two 20-ton cranes for the Quincy Engine Company, Quincy, Ill., and two of the same size and capacity for the United States Cast Iron Pipe Company, Buffalo, N. Y.; five cranes, one of 100 tons capacity, two of 30 tons and one each of 10½ tons capacity, have also been shipped to the Lake Shore & Michigan Southern Railroad at Cleveland, Ohio, and a 25-ton crane, being the second of the same capacity, has been delivered to the Oil Well Supply Company, Oswego, N. Y.

The George A. Hogg Iron & Steel Foundry Company, Pittsburgh, manufacturers of rolling mill machinery, are equipping the annealing furnaces of the Union Horse Nail Company at Chicago, Ill., with the Freeman furnace charger. They have also awarded the contract for the machinery for the new steel mill which William Jessop & Sons of England are now building at Washington, Pa. The firm also received the contract from the Wright Shovel Company of Anderson, Ind., for a complete 22-inch train of rolls for rolling shovel blanks.

The Mesta Machine Company, Pittsburgh, manufacturers of heavy mill and blowing engines, rolling mill machinery, rolls, machine molded gears and steel castings, have received an order from the Colorado Fuel & Iron Company of Pueblo, Col., for a 24-inch universal mill. The Mesta Machine Company also have an order for all of the tables connected with the above mentioned mill. The mill consists of one stand of pinions and four stands of two-high rolls, the first stand being universal mill and the three stands plain.

The Mueller Mfg. Company, Decatur, Ill., manufacturers of water and gas tapping machines, &c., are rearranging their plant for the more economical production of their goods. Among the notable changes is the building of a new foundry building. The capacity will not be increased and they will require no new equipment.

A large addition to the machinery of the mill and the general equipment will be made by the Southern Hosiery Mills Company, recently organized, who will acquire the property of the Clermont Mills, at New Berne, N. C.

Having completed a large boiler shop, the Marion Steam Shovel Company of Marion, O., will build their own boilers.

Boilers, Engines and Accessories.

Palmer Bros., Mianus, Conn., builders of gasoline engines and launches, have purchased at Coscob the old Van Nostrand place, adjoining the shipyard of Palmer & Duff, upon which they will erect a new plant. They expect to be installed in the new plant by January.

Henry Vogt, president of the Henry Vogt Machine Company, accompanied by his architect and superintendent, have returned to Louisville after visiting a number of large manufacturing plants in different parts of the country with a view of getting the most up to date ideas as to arrangement and buildings for their new plant, which will cover 15 acres and will be situated near the central part of Louisville, Ky., with access to all the railroads entering and leaving Louisville. The demand for their absorption ice making and refrigerating machines and their boilers has forced them to take this step to take care of their increasing trade. In addition to their present product they are now putting on the market their new water tube boiler recently patented, and have already on hand a number of orders for these water tube boilers. It is expected that the new plant will be completed and in operation early in the spring, and in the meantime orders will be taken care of, as before, at their present plant. The transfer will be made without any interruption in their business.

The Baldwin Locomotive Works of Philadelphia have recently delivered to the Baltimore & Ohio Railroad 35 locomotives. They are going to run from New Castle Junction on the Pittsburgh & Western to Chicago, hauling heavy coal trains, now being handled over the line. The engines are of the 2000 class and equipped to permit their use on passenger trains, if necessity demands.

The Marion Steam Shovel Company of Marion, Ohio, have completed a large boiler shop and will commence about January 1 to build their own boilers.

Fires.

The molding mill of the I. H. Brown Molding Company, Somerville, Mass., manufacturers of builders' finish, was last week burned. The tools and machinery were completely destroyed. The loss is estimated between $18,000 and $20,000.

The plant of the Allis-Chalmers Company, Milwaukee, Wis., last week suffered a $10,000 loss by fire.

The large foundry of Harry S. Hart, at Salem, N. J., was totally destroyed by fire on October 30. The estimated loss is $5,000, with an insurance of $2500.

The plant of the Illinois Steel Boiler Works, Chicago, Ill., was destroyed by fire October 28, entailing a loss of about $10,000.

The Garden City Nickel Plate Works, Chicago, Ill., suffered a $5000 loss by fire October 27.

The G. B. West Company, Harrisburg, Pa., manufacturers of corrugated iron ornaments, lost heavily by a fire last week. Their entire plant was destroyed, along with valuable machinery.

The plant of the York City Wheel Company, York, Pa., was last week damaged by fire. The loss is covered by insurance.

The West Coast Asphalt factory at Waukegan, Ill., was destroyed by fire November 1. The plants of the Wilder-Manning Tannery & Porter Battery Company were considerably damaged. Total loss, $50,000.

Jacob Dold & Co.'s packing establishment at Buffalo, N. Y., was destroyed by fire November 2. Loss is about $200,000.

Foundries.

The Birmingham Pipe & Casting Company, Birmingham, Ala., who were organized in January, 1900, have just completed very extensive improvements in their plant and are now prepared to furnish the legitimate jobbing trade a full line of soil pipe and fittings.

The Hood Machine Company, Birmingham, Ala., have closed a contract to supply the Seattle Telephone Company, Seattle, Wash., with all the castings necessary for the construction of their underground system, amount required being about four carloads.

The Williamson Iron Company, Birmingham, Ala., have furnished the Pioneer Mining & Mfg. Company, Birmingham, four sets of castings for boilers, built at Sharon, Pa., and have now an order for another set. They have also made castings for the company for Jenifer, Ala.

The partnership lately subsisting between W. E. Campbell and John R. Davis, carrying on a general foundry business at Alexandria, Ind., under the style of Campbell & Davis, has been dissolved by mutual consent. The business will be carried on by John R. Davis.

The Dimmick Pipe Foundry, Birmingham, Ala., have been full of work the whole year. Of contracts recently filled by them are: Supplying pipe for the Atlanta gas and water works, Atlanta, Ga.; pipe for the Kansas City gas works, Kansas City, Mo.; pipe for the Indianapolis water works, Indianapolis, Ind.; pipe for the New Orleans water and gas works, New Orleans, La.; pipe for the Newark gas works, Newark, N. J.; pipe for water and gas works, San Francisco, Cal., and to several of the other leading cities on the Pacific slope.

John C. Lindsay has purchased a building at Burlington, N. J., which he has remodeled into a modern foundry for the manufacture of all kinds of castings. The shop will be equipped with the trolley system for the conveyance of the melted iron to the molders, and other modern appliances.

An extensive new plant will be erected at Buffalo, N. Y., by the American Radiator Company of Detroit.

The Wilmington Malleable Iron Company, Wilmington, Del., were transferred on October 31 to J. W. and Harris Wittemore of Naugatuck, Conn., who have purchased the capital stock and will continue the business of manufacturing malleable iron castings under the name of the Wilmington Malleable Iron Company. The old company were incorporated in 1881 with a capital stock of $100,000. J. H. Baily was president and James Baily treasurer. The new owners will make numerous improvements in the plant, the wharf frontage on the Brandywine River is to be remodeled, new engines, tools and equipment will be installed, and the plant brought to the modern standard in every department.

The Massillon Iron & Steel Company, Massillon, Ohio, engineers, founders and machinists, have awarded to the Massillon Bridge Company the contract for the erection of an addition, 100 feet square, to the main building, whose dimensions will then be 350 x 100 feet. Later the company expect to add to the main structure a south wing, 150 x 100 feet, space for which has been reserved and cleared. All the equipment to be installed has been contracted for with the exception of cranes, which the company build themselves. The company make principally cast iron pipe and heavy castings.

The Frank M. Sager Smelting & Mfg. Company have opened their plant near Corlett Station, near Cleveland. They make a specialty of smelting scrap iron and manufacturing machine parts.

Bridges and Buildings.

The Groton Bridge Company, Groton, N. Y., are erecting a bridge and structural plant of 12,000 tons capacity. The foundry, machine shop and power house buildings are already completed and are partly equipped. They expect to have the plant in operation early in the spring. The design and construction are under the direction of the company's consulting engineer, E. M. Schofield.

Hardware.

The Merrill-Stevens Mfg. Company, Niles, Mich., manufacturers of snow shovels, &c., have removed their plant to Kalamazoo.

The plant of the American Washboard Company, Cleveland, Ohio, was almost entirely destroyed by fire on the 23d ult. The office building, the engine room and most of the lumber piles were saved. The company were heavily insured. About 300 persons were thrown out of employment by the fire. The company had a large stock on hand and a night and day shift of workmen were employed.

The handle factory at Creston, Ohio, owned by the Hubbard Mfg. Company, Pittsburgh, Pa., was destroyed by fire on the 23d ult.

The new molding department of the Wrightsville Hardware Company, Wrightsville, Pa., has been put into operation. The opening of the new department will add much to the turning out of material. This department was built several years ago but has never been used. A large cupola was erected and a large engine to run it was put in several weeks ago. The shop will require about 50 molders and, when filled up, the two molding shops together will employ about 125 men.

The drop forge shop in Hurlock, Md., is about to resume operations under new management. Horseshoes will be the principal product. Joseph B. Andrews is one of the parties interested in the enterprise.

The Reynolds Wire Company, Dixon, Ill., have just completed a four-story addition to their plant, 80 x 100 feet. Besides adding a number of looms for the weaving of screen wire cloth, including bronzed, coppered and tinned cloth of all grades, they have installed new machinery of the latest design for the manufacture of corn poppers, flour sifters, strainers and sundry articles for household and other requirements. The new plant, as also their entire factory, is equipped with modern heating and ventilating appliances, also with their own electric lighting plant, and the entire factory is operated by water power, the Rock River at Dixon affording abundance of power at all seasons of the year. A new illustrated catalogue will soon be issued, fully describing their line of goods.

E. Van Noorden Company, Boston, Mass., are building 500 single pitch galvanized iron skylights about 8 feet square for the Atlas Tack Company, Fairhaven, Mass. They are also at work on an order for about half of that quantity for the Soule mill at New Bedford, Mass.

The Alexander Mfg. Company, Canonsburg, Pa., are erecting a plant for the manufacture of the Acme stove pipe elbows and drip pans. The company have a capital stock of $12,000.

Miscellaneous.

Having outgrown their present quarters, the Grand Rapids Show Case Company, Grand Rapids, Mich., have purchased a plant containing about 75,000 square feet of floor space, which they will occupy as soon as the machinery, electric wiring, &c., can be installed.

Fred. Q. Hartman, proprietor of the Danville Silk Mill, Danville, Pa., has purchased a plot of ground at Berwick, upon which he will erect a large silk mill.

The Peck Edge Tool Company, recently incorporated, have taken over the plant and business formerly carried on by Fred. W. Peck, at Cohoes, N. Y. The company will manufacture axes, hatchets, adzes, broad axes, &c.

The recently organized Beggs-Goodson Wagon Company are in the market for considerable equipment for the new plant they are building at Hannibal, Mo., for the manufacture of farm and freight wagons for the wholesale trade. J. W. Beggs advises us that they expect to be in operation by January.

The old Stewart Iron Works, at Wichita, Kan., have been leased and are being fitted up by J. W. Vaniman, who will deal in agricultural machinery. He will handle the goods manufactured by the Geiser Mfg. Company of Waynesboro, Pa.

The Fiske Brick Company, Dover, N. H., are erecting a new plant, to consist of a main building 367 x 57 feet, and an engine, boiler and machinery house 115 x 50 feet.

The Patapsco Electric & Mfg. Company, Ellicott City, Md., are developing power from the Patapsco River, a mile below Ellicott City, for the purpose of supplying light and power for that city and surrounding districts. They will also engage in manufacturing business. The construction of the power house and dam is about completed.

The Toledo, Adrian & Jackson Railway, consolidated by the Toledo & Western Railway Company of Sylvania, Ohio, are equipping their new road with Lorain steel motors and Westinghouse motors, Peckham trucks and cars built by the Jewett Company. The General Electric Company are supplying the power house equipment.

The John Deere Company have been organized at Indianapolis, Ind., for the purpose of selling agricultural implements, vehicles, wagons, &c. The company are a branch of Deere & Co., Moline, Ill.

The Marietta Knitting Company, Marietta, Ga., have bought 17 additional knitting machines, which will increase the complement to 116 machines.

The Northwest Thresher Company, Stillwater, Minn., have purchased the property and business of the Minnesota Thresher Mfg. Company and are now engaged in improving the plant, building new additions and in other ways preparing for a larger output of threshing machines and traction engines. Among the new additions are a foundry and paint shops.

A small quantity of new equipment will be required by the Barney Marble Company, Swanton, Vt., who are building an addition 60 x 80 feet to their plant, to be used as a finishing and polishing department.

The National Trolley Harp Company will shortly be organized, at Pittsfield, Mass., by Geo. H. Russell of that city, R. A. Manoch and others, with a capital of $10,000, for the manufacture of a trolley harp, invented by Henry C. Heno.

G. J. Barrows of 68 Walton street, Atlanta, Ga., and associates are contemplating the establishment of a mill for the manufacture of handkerchiefs and pillow cases. As soon as the project is definitely decided upon they will be ready to receive bids for machinery and other equipment.

The Wabash Portland Cement Company, Detroit, Mich., advise us that they have no contemplated extensions to their plant, at Stroh, Ind., in view, as reported.

Edward M. Taylor of Wilmington, Del., has purchased of Hughes McInnes the Rebecca Paper Mills, Bridgeport, Pa., for $38,000. The mills will shortly be put in operation.

A company have been organized at Conneaut, Ohio, for the manufacture of shovels. John Romberg of Ashtabula, owner of several patents on shovels, has organized the company, and the Chamber of Commerce of Conneaut have agreed to give them a factory site and buildings to locate there.

The foundations for the two largest buildings for the new plant of the New Castle Stamping Works, New Castle, Pa., have been finished and the brick work has been started. The buildings will be large structures and work will be pushed as fast as possible.

The American Can Company, 21 State street, New York City, are about to make many improvements to their plants in Baltimore, Md. The factory of the R. Tynes Smith Company is to be made one story higher and modern machinery installed, and a large warehouse will be erected at the works of the Morton Tinplate & Can Company.

The N. P. Pratt Laboratory, Atlanta, Ga., have received the contract for the erection of the large plant at Savannah, Ga., for the Southern States Phosphate Fertilizer Company.

The Sligh Furniture Company, Grand Rapids, Mich., are building a four-story and basement brick addition to their factory, which will be used as a warehouse.

The employees of the shops of the Erie Railroad at Meadville, Pa., have been given an advance of 10 per cent. in wages.

The American Radiator Company have purchased 23 acres of land on Hertel avenue and the Delaware, Lackawanna & Western tracks, in the northern section of Buffalo, and will erect thereon a plant nearly three times as large as the Pierce plant on Elmwood avenue, Buffalo, also controlled by this company. The buildings will be of brick and of permanent construction. It is understood that the plant will manufacture mainly for the export trade. The plan is to have it in operation next summer. Contracts have been awarded for the erection of the buildings.

Trade Publications.

Pneumatic Tools.—We have received from the Chicago Pneumatic Tool Company, Monadnock Block, Chicago, a very elegant catalogue showing their pneumatic tools employed on some of the most noted structural work in the country. The half-tones are remarkably clear and sharp, and being printed upon high grade paper all their good features are well brought out. The tools illustrated consist of calking and riveting hammers, which are shown as employed on steel framed buildings, bridges, ship yards, boiler and tank work, railroad work and the like. In the Duntley compression riveters, the cylinders are absolutely independent of the frame, and are made to fit all styles of yokes. Their large boiler riveter has a throat 16 inches deep, and is made to exert pressures from 25 to 100 pounds per square inch with 80 pounds of air. The wide application of the Boyer air drill is well brought out in the illustrations. The company's pneumatic painting machine is a simple device worked on the principle of an ordinary atomizer, and sprays the paint on the surface. Engravings are also presented of pneumatic cranes for handling all kinds of material, pneumatic geared hoists, air compressors, &c.

Insulated Wires and Cables.—The Simplex Electrical Company of Boston have prepared a catalogue of their insulated wires and cables. Their rubber covered cables are designed under the rules of the National Board of Fire Underwriters for general use on circuits not exceeding 600 volts. The stranding is concentric, with flexibility sufficient for ordinary use, and each wire is separately tinned. The coating is of solid rubber without seam. The company are prepared to make lead covered cables of any desired size with insulation adapted to high or low voltage; also cables of any practical diameters for lighting, for power circuits, for telegraph and telephone circuits. They make a specialty of submarine cables.

Leather Belting.—The Charles Munson Belting Company, 38 South Canal street, Chicago, have prepared an interesting catalogue dealing with their leather belting and belting appliances. Their plant has been entirely renovated, remodeled and enlarged. New machinery has been added to increase the productive capacity and meet the growing demand for their belting, and with their present facilities they claim that they have the best equipped belt factory in the country. The leather which they use in the construction of their belting is invariably the best portion of the hide. By reason of their improved stretching machinery they are enabled to take out the excess stretch and still leave the vitality of the leather unimpaired.

A yard of facts regarding the superiority of Warwick chains is contained on a 36-inch hanger which has just been issued by the Newhall Chain, Forge & Iron Company, 26 Cortlandt street, New York. Besides descriptive matter pertaining to the chains manufactured by this company there are a number of facts that chain users in general should know. This feature makes the hanger of considerable interest to manufacturers employing heavy chains in their processes and machinery. There is also a table showing approximately the pitch, dimensions, weights, tests, breaking strains and safe working loads of steam shovel, dredge and hoisting chains. Views of the company's works are shown as well as interesting illustrations of the wearing qualities of this particular chain.

The Iron and Metal Trades.

The strength of the situation is indicated by a number of facts. The Steel works of the country in the month just ended have broken all records of production, yet their output falls short of the demand. Steel consumers in notable instances are in distress because they cannot obtain a sufficient supply of Billets to meet their current requirements. We may be obliged to import Billets to a considerable extent until either the consumption diminishes or new Steel works now under construction get into operation. That the demand for Pig Iron is also outrunning the current production is shown by the steady diminution of stocks at the furnaces. The stock held by the leading producer of Foundry Pig Iron has been depleted more than half since July 1, the reduction in October having been greater than in any of the preceding months. Other producers report a similar experience. The opening days of November have brought no tidings of a falling off in the demand for Pig Iron, but on the contrary the tonnage being daily booked is up to the October average. When Southern Gray Forge Pig Iron is being sold in round quantities for shipment to Youngstown it indicates a significant shortage in that locality. The difficulty in securing Coke because of a shortage of cars or insufficiency of locomotives is now affecting blast furnaces so near the great Coke region as the Mahoning and Shenango Valleys. It can scarcely be believed, however, that the situation of these furnaces is as serious as reported in the daily papers. Strenuous efforts will certainly be made to overcome such a difficulty. Nevertheless, it is obvious that the equipment of the railroads is not equal to the traffic which they are now being called on to move. The shortage in the corn crop, which had been expected to cut down the business of Western railroads quite considerably, has been more than made up by the record breaking movement of general merchandise.

Prices are generally stationary, although it is believed that advances could easily be made and maintained on a number of products now in heavy demand. Makers, however, especially the largest, appear to be of the opinion that while the market might bear some advance yet it would not be wise to take a step which might check consumption or cause projects to be deferred that will readily be undertaken on the present basis of costs. The only direction in which any tendency toward lower prices is observed is in Wire Nails. The decline is sufficient in connection with the high cost of Steel to cause the small manufacturers to begin to drop out of the race.

Heavy transactions in both Bessemer and Basic Pig Iron have occurred in Eastern markets. One consumer is understood to have bought 25,000 tons. The demand for Heavy Melting Steel Scrap is in excess of the home supply and figures are being made for importation.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Nov. 6 1901	Oct 30. 1901	Oct. 9, 1901	Oct 31 1900.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	**$15.25**	$15 00	$15.00	$15.00
Foundry Pig, No. 2, Southern, Cincinnati	13.75	13.75	13.75	12 00
Foundry Pig, No. 2, Local, Chicago	**14.75**	14 75	14.50	14.50
Bessemer Pig, Pittsburgh	16.00	16.00	15 85	13 15
Gray Forge, Pittsburgh	**14.10**	14.10	13.75	12.75
Lake Superior Charcoal, Chicago	17.00	17.00	17.00	17.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh (nom)	**27.00**	27 00	26 50	18.00
Steel Billets, Philadelphia (nom)	**28.00**	28.00	26 50	20.00
Steel Billets, Chicago, (nom)				19 50
Wire Rods (delivered)	35.00	35.00	34.50	33 00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	26 00
Spikes, Tidewater	1.80	1 80	1 80	1 45
Splice Bars, Tidewater	1.50	1 50	1 50	1 25
OLD MATERIAL, PER GROSS TON:				
O. Steel Rails, Chicago	**14.00**	14 00	13 50	10 00
O. Steel Rails, Philadelphia	*17.00*	17.25	17 75	14.00
O. Iron Rails, Chicago	21 00	21 00	21 00	16 00
O. Iron Rails, Philadelphia	21 00	21 00	20 00	16 50
O. Car Wheels, Chicago	16.00	16.00	16 00	15.00
O. Car Wheels, Philadelphia (nom)	*16.00*	15.00	16 50	16.50
Heavy Steel Scrap, Chicago	**13.50**	13.50	13 00	9 50
FINISHED IRON AND STEEL, PER POUND:				
Refined Iron Bars, Philadelphia	**1.65**	1 65	1 62½	1 25
Common Iron Bars, Chicago	1 70	1.70	1 70	1 35
Common Iron Bars, Youngstown	**1.60**	1 60	1 50	1 20
Steel Bars, Tidewater	1.62½	1 62½	1 65	1.25
Steel Bars, Pittsburgh	*1.60*	1.55	1.50	1 10
Tank Plates, Tidewater	1.75	1.75	1 75	1.35
Tank Plates, Pittsburgh	1.60	1 60	1 60	1.25
Beams, Tidewater	1.75	1 75	1.75	1 65
Beams, Pittsburgh	1.60	1.60	1 60	1 50
Angles, Tidewater	1.75	1 75	1 75	1 55
Angles, Pittsburgh	1.60	1 60	1 60	1 40
Skelp, Grooved Iron, Pittsburgh	*1.80*	1 80	1 90	1.45
Skelp, Sheared Iron, Pittsburgh	*1.85*	1 85	2 00	1 50
Sheets, No. 27, Pittsburgh	*3.00*	3 00	3.15	2.80
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2 90	2 80
Wire Nails, f.o.b. Pittsburgh	*2.20*	2 25	2.25	2.20
Cut Nails, Pittsburgh	2.05	2 05	2 00	1.95
METALS:				
Copper, New York	16.85	16 85	16.50	16.75
Spelter, St. Louis	4.12½	4.12½	4.05	4.10
Lead, New York	4.37½	4.37½	4.37½	4.37½
Lead, St. Louis	4.25	4.25	4.25	4.22½
Tin, New York	*24.60*	24.85	24.40	27.85
Antimony, Hallett, New York	*8.37½*	8 50	8.50	9.50
Nickel, New York	60.00	60 00	60 00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.00

Chicago.

FISHER BUILDING, November 6, 1901.—(*By Telegraph.*)

Current wants make up the body of present trade. There is no large buying movement in progress. It is true that a number of contracts are being closed for future delivery, but they are such as naturally arise day by day, not the consequence of any unusual condition of the market. The question of future prices does not enter largely into the market, for while some buyers say values will decline and while others look for a slight rise, quotations reasonably stable are the general expectation. With the above explanation, the present volume of trade is eminently satisfactory. The fact crops out in more than sporadic instances that large consumers have not provided for their coming wants sufficiently. Supplementary orders are already a factor for the season that ends next summer, and on the whole mills are selling product faster than they are making it. Merchant Steel is extremely difficult to procure before next summer's delivery, the situation growing worse steadily, and that, too, in the absence of any unusually large orders. Buying has been noticeably good in Structural Material, in Pig Iron and in Rails.

Pig Iron.—The number of inquiries for approximately 1000 tons each and for deliveries running up to next summer is large. Many of them are being closed. Occasionally an order for 2000 or 3000 tons is entered.

This business is shared by Northern and Southern furnacemen alike, and the trade in smaller lots is equally satisfactory. There is an absence of any large orders, all the heavy consumers apparently having bought for some time ahead. But if consumers are thus well provided, makers also are well stocked with orders and the temper of the market is strong. One seller of Southern Iron who several weeks ago was not much of a factor in the local trade, because of high quotations to which he was limited, remarks that he now has no difficulty in obtaining his share of the current business. While Coke is reported by some interests to be coming forward more plentifully, this is not the universal rule and early this week it was an even chance whether one of the local furnaces in blast would not have to bank its fires. Coke supplies were received only from a day to a half day ahead. Application for Coke to operate the new furnace was made to eight different producers, but without success, and the furnace remains idle. Prices are unchanged, as follows:

Lake Superior Charcoal	$17.00 to $18.00
Local Coke Foundry, No. 1	15.25 to 16.00
Local Coke Foundry, No. 2	14.75 to 15.25
Local Coke Foundry, No. 3	14.25 to 14.75
Local Scotch, No. 1	15.25 to 16.00
Ohio Strong Softeners, No. 1	17.00 to 17.50
Southern Silvery, according to Silicon	15.65 to 16.00
Southern Coke, No. 1	15.15 to 15.40
Southern Coke, No. 2	14.40 to 14.65
Southern Coke, No. 3	13.90 to 14.15
Southern Coke, No. 1 Soft	15.15 to 15.40
Southern Coke, No. 2 Soft	14.40 to 14.65
Foundry Forge	13.40 to 13.65
Southern Gray Forge	13.15 to 13.40
Southern Mottled	13.15 to 13.40
Southern Charcoal Softeners, according to Silicon	15.50 to 16.50
Tennessee Silicon Pig	16.40 to 16.65
Alabama and Georgia Car Wheel	19.50 to 20.50
Malleable Bessemer	15.75 to 16.00
Standard Bessemer	.... to 17.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon	15.75 to 16.25

Bars.—The Bar trade continues active. The current demand is about keeping even with the supply. Reasonably prompt shipment can be made from smaller rolls, but for the product of 10-inch or larger mills there are delays in shipment. Prices are well maintained. The railroad companies are among the good buyers, but demand is not restricted to any lines of consumption. Prices are unchanged at 1.70c. for Common Iron and 1.65c. for Soft Steel Bars. From stock quotations are 2c. for Common Iron; 1.90c. to 2c. for Steel Bars, and 2.50c. for Steel Hoops.

Structural Material.—The contract for the Lake Shore and Rock Island passenger station, pending for months, has been closed, work to begin soon. About 9000 tons of Shapes will be required. Another contract closed this week was for 8000 tons of Structural Material for car construction. Jobbers are good purchasers of Shapes and in small lots a large tonnage is still going to the country, shipments being usually delayed. New trade is being protracted later than the usual season. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—One order for several thousand tons was placed this week and store trade, recently revived, continues active. Prices are firm. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank, and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—Steady progress is made toward a resumption of normal quotations from store because of more generous receipts. The latter, however, do not include all sizes and for some sizes there is continued scarcity. No. 27 Common is now selling at 3.50c. to 3.75c. Galvanized also is slightly lower, quotations ranging from 65 and 10 to 70. Tin Plates are arriving somewhat more freely and famine prices are slowly receding.

Billets.—Transactions in Billets are confined to a few small orders for Open Hearth, which are quoted at $31. Small lots of Southern Billets also are selling here.

Merchant Pipe.—Store trade shows considerable life, but the colder weather this week is having a restricting effect. Prices are without change. Carload lots are now quoted as follows, random lengths: Black, ⅛ to ½ inch, 60 off; ¾ to 10 inches, 67 off; Galvanized, ⅛ to ½ inch, 47 off; ¾ to 6 inches, 55 off.

Boiler Tubes.—The call for Boiler Tubes is fairly good, and there is some buying for nearby future shipments to cover contract work. Quoations are as follows:

	Steel.	Iron.
2¾ to 5 inches	57½	47½
1¾ to 2½ inches	50	40
1 to 1½ inches	35	30
6 inches and larger	52½	45

Rails and Track Supples.—Western mills are as a rule sold further ahead than Eastern mills and some of the latter are now taking most of the current trade in Standard Rails for the reason that they can make better deliveries. There has been a large business this week. The Wabash road bought extensively, it is said, and one or two other Western systems, for tonnages considerably in excess of 10,000 each. In small lots of 1000 tons or less there is a good trade. Prices are without change. Track fastenings are quoted as follows: Splice Bars, 1.65c. to 1.75c.; Spikes, 2c. to 2.10c.; Track Bolts, with Hexagon Nuts, 2.90c. to 2.95c.; Square Nuts, 2.75c. to 2.80c.

Merchant Steel.—Perhaps the majority of makers have burdened their order books to such an extent that they now decline under ordinary conditions to quote prices for delivery during the first half of 1902. There is continued demand in moderate sized lots and for prompt shipment the Steel is extremely scarce. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 6¾c. for carloads and 7c. to 7½c. from store; Specials, 12c. upward.

Old Material.—Because of the divergent views of buyers and sellers the market shows little life. There are a fairly good number of sales, but they are usually at terms not in line with open quotations. While holders are not asking higher prices consumers are still offering only reduced quotations. The following are approximate quotations per gross ton:

Old Iron Rails	$21.00 to $21.50
Old Steel Rails, mixed lengths	14.00 to 14.50
Old Steel Rails, long lengths	18.00 to 18.50
Heavy Relaying Rails	25.50 to 26.00
Old Car Wheels	16.00 to 16.50
Heavy Melting Steel Scrap	13.50 to 14.00
Mixed Steel	10.50 to 11.00

The following quotations are per net ton:

Iron Fish Plates	$17.50 to $18.00
Iron Car Axles	21.00 to 21.50
Steel Car Axles	16.50 to 17.00
No. 1 Railroad Wrought	15.50 to 16.00
No. 2 Railroad Wrought	13.50 to 14.00
Shafting	16.50 to 17.00
No. 1 Dealers' Forge	13.00 to 13.50
No. 1 Busheling and Wrought Pipe	11.50 to 12.00
Iron Axle Turnings	11.25 to 11.75
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	5.00 to 5.25
Mixed Borings, &c	5.25 to 5.50
No. 1 Boilers, cut	11.00 to 11.50
No. 2 Boilers, cut	9.50 to 10.00
Heavy Cast Scrap	11.25 to 11.75
Stove Plate and Light Cast Scrap	8.50 to 9.00
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 11.50

Metals.—Trading in Copper is rather more active with prices a shade firmer, but no higher. Lead is dull. Carload lots of Lake are held at 17c., and Casting brands at 16½c. Pig Lead stands steadily at 4.32½c. for Desilverized and 4.42½c. for Corroding, in 50-ton lots. Dealers continue to quote selling prices on small lots of Old Metals as follows: Copper Wire and Heavy, 15c. to 15½c.; Copper Bottoms, 14c.; Pipe Lead, 4.15c.; Zinc, 2.75c.

Coke.—Both furnaces and foundries are inconvenienced, to say the least, by the car famine. There is a still hunt for every car that arrives and premiums are the rule, though on future shipments quotations are without change. Connellsville Foundry Coke is selling

at $4.75 to $5, usually, but with a few transactions at $5.25.

The Allison Mfg. Company, Philadelphia, have appointed A. M. Castle & Co., 54 to 60 South Canal street, Chicago, their Western representatives.

Philadelphia.

FORREST BUILDING, November 5, 1901.

The Iron and Steel markets seem to be gathering strength in nearly all lines, and as a matter of fact the situation is one of remarkable activity. There were some indications during the past two or three weeks of a culmination in the heavy demand for Plates and Bars, but they have again fallen into line (especially the former) and so much business is being placed for cars, locomotives and other railway equipment that it is highly probable that the interests mentioned will soon be fully toned up so as to be in harmony with the rest of the market. The best proof that can be given of the extraordinary activity is the absolute scarcity of almost every kind of material for prompt delivery, and as this is in the face of the largest consumption ever made, it is truly a most surprising feature. Under such conditions it would be very much out of place to talk pessimistically, although it is an undoubted fact that a high degree of prosperity in view of almost everything in opposition to what is supposed to make a healthy market is a phenomenon almost unparalleled.

Pig Iron.—A very strong market is reported on all sides. Most of the business is for short deliveries, but something is being done for the first half of next year. Prices for the first mentioned are firm and at full or slightly higher figures, while for the longer dates the average is about 25c. less. There is great diversity in prices, however. Some makers are disposed to take advantage of the scarcity and to squeeze a little more money out of needy buyers, while others appear satisfied to go along at unchanged prices. For 1902 deliveries some furnaces are taking all the business that comes along at about to-day's prices, while others who are not quite as confident are disposed to shade about 25c. for strictly first-class business. There are no evidences of uneasiness, however, and as a rule if buyers are not ready to accede to sellers' terms no special efforts are made to induce them to do so. Sales have been on a fairly large scale, Foundry and Mill Irons at unchanged prices, some large blocks of Bessemer at about 50c. advance, and a considerable tonnage in Basic, probably about 25,000 tons, at about the same figures as during last month. There is quite a scarcity of good Iron, however, for prompt shipment, and the tone of the market is decidedly strong at figures within the following range for Philadelphia and nearby points, and 25c. to 50c. less for deliveries within a radius of 100 miles south or west: No. 1 X Foundry, $15.75 to $16; No. 2 X Foundry, $15.25 to $15.50; No. 2 Plain, $14.75 to $15; Standard Gray Forge, $13.75 to $14; Ordinary Gray Forge, $13.25 to $13.50; Basic (Chilled), about $14; Bessemer, large sales at about $15.50.

Billets.—It is almost impossible to quote prices on Steel, as everything depends upon the character of the order. For shipments during 1901 prices vary from $28 to $29, but German Steel is offered at less than $28 for same dates. It is expected that some revision in prices will be made soon, but while the present scarcity continues it is not likely that they will be lower.

Plates.—There has been a considerable improvement in the demand during the past week and local mills have taken some very large orders, buyers including shipbuilders, bridge builders and a considerable tonnage for the boiler and locomotive shops. Mills have now got a considerable tonnage on their books, and have a practical certainty of a very active winter's work. Prices about as follows for Philadelphia and nearby deliveries: Universals, 1.75c. to 1.80c.; Sheared, 1.75c. to 1.80c.; Flange, 1.85c. to 1.95c.; Fire Box, 1.95c. to 2.05c.; Marine, 1.95c. to 2.05c.

Structural Material.—There is no abatement in the demand for Shapes, and deliveries are as far behind as ever, with no probability of catching up for a long time to come. It would not be much of a surprise if imports were made, as freights are low and prices of Steel in Europe very much below quotations in the United States. Prices nominally as follows for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—The demand is not as active as in other lines, but there is still a very fair demand, and mills are mostly running pretty full time, although orders on hand are not near as large as they were some time ago. With a renewed demand in other lines, however, it is quite likely that the demand for Bars will again show an improving tendency: Prices are well maintained, with not much prospect of change, Iron Bars being 1.65c. to 1.70c., and Steel Bars 1.62½c. to 1.65c. for carload lots as a minimum.

Sheets.—The demand has again become very active and deliveries are about as hard to get as at any time during the year. Prices are hardly quotable, as the exigencies in each individual case have to be considered before a price can be named. No. 28 has sold at 4.25c., however, and it is doubtful if purchases could now be made at much less than 4.50c., unless the buyer could wait his turn for delivery. Prices nominally as follows for best Sheets (Common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.80c. to 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.75c. to 3.90c.; No. 28, 4.25c. to 4.40c.

Old Material.—There is a better demand, and although Steel is something lower than it was a week ago, prices generally are very steady. Bids and offers for deliveries in buyers' yards are as follows: Choice Railroad Scrap, $19.50 to $20.50; Country Scrap, $16 to $17; No. 2 Light (Ordinary), $12 to $12.50; No. 2 Light (Forge), $13.75 to $14.50; Machinery Cast, $14 to $14.50; Heavy Steel, $17 to $17.50; Old Steel Rails, $17 to $17.50; Old Iron Rails, $21 to $21.50; Wrought Turnings, $11.75 to $12.50; Cast Borings, $7.75 to $8; Old Car Wheels, sales at about $16; Iron Axles, $23.50 to $24; Steel Axles, $19 to $20.

St. Louis.

CHEMICAL BUILDING, November 6, 1901.—(*By Telegraph.*)

Pig Iron.—The market for Pig Iron is still controlled by the same influences as last reported, and a large and satisfactory volume of sales and inquiries can be noted. We called attention to the fact that several furnaces were practically out of the market for the first half of 1902, and additional cases to add under this classification came to our notice this week. It is to be hoped that the difficulties being experienced in the matter of transportation will not seriously hamper the furnaces by causing delay in the delivery of fuel. We quote as follows for cash, f.o.b. St. Louis:

Southern, No. 1 Foundry	$14.75 to $15.00
Southern, No. 2 Foundry	14.00 to 14.25
Southern, No. 3 Foundry	13.50 to 13.75
Southern, No. 4 Foundry	13.00 to 13.25
No. 1 Soft	14.50 to 14.75
No. 2 Soft	14.00 to 14.50
Gray Forge	13.00 to 13.25

Bars.—The demand is heavy and urgent in the market for Bars, and it is the general feeling that indications are not apparent pointing to any change in the condition of affairs. Prices hold at the same level. We quote: Iron Bars, 1.75c. to 1.85c.; Steel Bars, 2c. Jobbers quote Iron Bars, 2.10c. to 2.15c.; Steel, 2.10c. to 2.15c., full extras.

Rails and Track Supplies.—Nothing new can be reported in the Rail department of the market, as with production booked so far ahead new business can only be taken on basis of far distant delivery. There is a good call for Track Supplies, and we note no change in prices. We quote: Splice Bars, 1.75c. to 1.95c.; Bolts, with Square Nuts, 2.75c. to 2.90c.; with Hexagon Nuts, 2.90c. to 2.95c.; Spikes, 2c. to 2½c.

Sheets.—All grades and sizes of Sheets are in good demand, and a scarcity in certain lines is still evident. Jobbers quote, ¼-inch and heavier, 2.10c. to 2.20c.; Stove Pipe sizes of No. 27, 3.45c. to 3.50c.; Galvanized Sheets, 65 and 5 off, and in round lots 70 to 70 and 2½ is quoted.

Pig Lead.—The Pig Lead market continues on the same basis as last reported, both as to demand and prices. Soft Missouri at 4.25c. to 4.25½c., and Chemical at 4.30c. to 4.35c.

Spelter.—Good demand and no change in price as last quoted. We quote 4.12½c., as bid.

Cleveland.

CLEVELAND, OHIO, November 5, 1901.

Iron Ore.—Under the pressure of heavy bidding for tonnage on the part of the shippers of grain, the Ore shippers have been forced to pay $1.15 a gross ton on the movement of Ore from Duluth to Ohio ports. This is the fourth successive advance in recent weeks, and the conditions are such as to warrant the belief that it will by no means be the last one before the season is over. The car shortage continues to be an annoying feature of the transportation of Ore, with a consequent delay to all vessels engaging in the trade. These delays are directly responsible for the scarcity of boats in both the grain and the Ore trades, and in consequence the advance in freights is chargeable directly to the car supply. Rather than any relief being seen in the future the condition seems to grow worse, and serious delays may be occasioned before the season is over. It is evident now that it is to be a struggle to keep up the shipment of Ore to that point which will permit of a duplication of last year's movement of upward of 19,000,000 tons. A contract to carry a block of Escanaba Ore at 80c. a ton showed up to-day, and with it the wild rate was established. The Marquette rate has increased to $1, and boats are in fair demand.

Pig Iron.—The United States Steel Corporation and the other big buyers are still holding off on the purchase of Bessemer and Basic Iron on contract for next year's delivery. Some of the smaller consumers, however, are on the market with small lots which they are offering to the furnaces at the prevailing prices. In some instances orders for Bessemer have been placed at $15.25 to $15.50 in the Valley, but the quantities have not been great, and the transactions hardly form a basis for future action. Basic Iron shows a clearer tendency to seek a higher plane of prices. Smaller contracts, mentioned last week, are still pending on the basis of $15, with the strong possibility that this will be the established basis of prices soon. At present the selling for spot delivery is done at an approximate price of $14.50 in the Valleys, with some orders bringing $14.75. The latter are to consumers who are in sore straits for material. In the Foundry grades the market is notably strong, with orders in excess of shipment and with the capacity of the furnaces, in accordance, being sold up further and further ahead. The market is probably represented now by a quotation of $14 on No. 2 in the Valleys, with the usual differences on No. 1, but the amount of business which is to be done on those figures is expected to be limited, as there is a strong and general tendency to advance the quotations. Some furnaces, in fact, are now refusing to sell a ton of Iron for less than $14.50 for No. 2 in the Valleys.

Finished Material.—Steel Rails are leaders on the market this week, with very heavy buying shown from all sections. The many electric line projects which are now developing and have developed and the many extensions and improvements of existing steam lines have produced a strong demand for Steel Rails of all sizes, and the orders are pouring in. The ordering has been so heavy that it is beginning to be a question whether the mills will be able to make shipment when specifications are made on contracts when the spring opens. This condition is especially apparent when it is considered that a vast amount of Rail tonnage will be carried into next year, which will take precedence on delivery over the contracts which have been placed since the new era of buying began. The price holds firm at $28. The demand for Structural Material might almost be said to be abnormal for this time of the year. The buying keeps up steadily, and the orders are said still to be coming in in excess of production—a most extraordinary winter situation. The mills are so heavily loaded with orders that many building projects will not get their Steel before the end of the building season, yet the ordering is going ahead. The prices do not change in the least, being 1.70c. on Beams, Channels and Angles. The prospect for deliveries is not specially encouraging, particularly on the smaller sizes. The Bar situation is very much easier, and the market might be said to be a little weak. This does not particularly refer to prices as yet, although it is noticeable that production is gaining on the orders very largely, due perhaps to the recent increase in the producing capacity. The result so far has been to put the mills in position to make very prompt and satisfactory delivery on all orders. The prices hold at 1.55c., Pittsburgh, on Iron Bars; 1.50c., Pittsburgh, on Bessemer, and 1.60c., Pittsburgh, on Open Hearth Steel Bars. The Plate trade is in better condition than it has been for the last few weeks, and the weakness is disappearing before some new orders that have been showing up. The shipyards are taking more orders for boats, and the trade is in a very satisfactory condition. The market quotation does not change from 1.70c. Bessemer Billets are almost off of the market, and in some instances buyers are taking Open Hearth instead. The prices are ranging well up, $28 being about a minimum.

Old Iron.—The market is steady at old prices. Some grades show signs of weakness, however, among them being the Cast Scrap trade, which material seems to be supplanted now by Southern No. 2 in mixtures. The prices are quoted as follows: No. 1 Wrought, $16.50 net; Cast Borings, $8 gross; Wrought Turnings, $12.25 gross; Cast Scrap, $13 net; Stove Plate, $10 net; Heavy Steel, $17 gross; Steel Rails, $17 gross; Old Iron Rails, $22 gross; Old Steel Axles, $19 gross; Old Car Wheels, $17 gross.

Cincinnati.

FIFTH AND MAIN STS., November 6, 1901.—(*By Telegraph.*)

The history of the past week's business in the Pig Iron market is almost an exact duplication of what has been recorded each succeeding week for the last six. Furnaces are well sold up for the first quarter of next year. This is especially the case in regard to No. 4 Foundry and Mill Irons. A very large tonnage has also been placed for the second quarter deliveries. A review of the situation shows a large tonnage yet to be purchased, and every day brings new needs to light. The wisdom of the selling interests in refusing to follow the time honored traditions of bouncing prices up every time trade brightened is a subject of hearty congratulations. There is to-day practically but one scale of prices, and this is essentially so in Southern Irons. True there is here and there a sporadic case in which for some reason not plainly understood some seller makes some apparent concession, but it is believed that it is only seemingly so to those who do not know all regarding grade and so on. The market is steady and extremely satisfactory, and bids fair to so continue for some time. The scarcity of cars for Coke and Iron shipments is very exasperating, and the only ameliorating condition is that no favorites are being played. Freight from Birmingham is $2.75 to this point; from Hanging Rock district, $1.10. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	.... to	$14.25
Southern Coke, No. 2	.... to	13.75
Southern Coke, No. 3	.... to	13.25
Southern Coke, No. 4	.... to	12.75
Southern Coke, No. 1 Soft	.... to	14.25
Southern Coke, No. 2 Soft	.... to	13.75
Southern Coke, Gray Forge	.... to	12.75
Southern Coke, Mottled	.... to	12.75
Ohio Silvery, No. 1	$15.10 to	15.60
Ohio Silvery, No. 2	14.60 to	15.10
Lake Superior Coke, No. 1	15.10 to	15.60
Lake Superior Coke, No. 2	14.60 to	15.35
Lake Superior Coke, No. 3	14.10 to	14.85
Southern Basic	.... to	14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	$18.25 to	$18.75
Standard Southern Car Wheel, No. 2	17.25 to	17.75
Lake Superior Car Wheel and Malleable	18.50 to	19.00

Plates and Bars.—With no material change in conditions the price-list remains unchanged; buying has hardly been so brisk but fairly good nevertheless. We

quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.67c. to 1.70c., with half extras; same, in small lots, 1.85c. to 1.90c., with full extras; Steel Bars, in carload lots, contract delivery, 1.65c.; same for prompt delivery, 1.75c. to 1.80c.; Base Angles, in carload lots, 1.90c.; Plates, ¼-inch and heavier, 1.90c. to 2c.; 3-16 inch, 2.10c.; Sheets, No. 16, 2.90c. to 3c.

Old Material.—The market is quiet and steady. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, $14 to $14.75; Cast Railroad and Machine Scrap, $12.25 to $12.75; Iron Axles, $19 to $20; Iron Rails, $17.25 to $18.25; Steel Rails, rolling mill lengths, $14.75 to $15.25; short lengths, $13.75 to $14; Car Wheels, $16 to $17. All prices except No. 1 Wrought on the basis of gross tons.

Pittsburgh.

HAMILTON BUILDING, November 6, 1901.—(*By Telegraph.*)

Pig Iron.—The whole Pig Iron market is as strong as it possibly could be, and it has been made stronger by the fact that some of the blast furnaces in the valleys have been compelled to bank for two or three days at a time owing to a scarcity of Coke. The situation as regards the supply of Coke is serious and seems to be getting worse. Not a car of Coke left the Connellsville region Friday and Saturday of last week for shipment west of Pittsburgh. Negotiations are on between the Bessemer Furnaces Association and United States Steel Corporation for the purchase of a round lot of Bessemer Iron for December shipment, but the deal has not yet been closed. The furnaces are taking the position that the corporation, in view of the low price of Bessemer Iron, should be willing to buy from month to month, as it will facilitate fixing the monthly price of Bessemer Iron on which the corporation sells large quantities of Steel and fit Finished Material. The minimum price of Bessemer Iron is $15.25 at Valley furnace, and it is reported small lots for prompt shipment have brought $15.35 to $15.50. Forge Iron is firm and higher, and is held at $14.25 to $14.50, Pittsburgh. Foundry Iron is scarce for prompt shipment, and is bringing good prices. We quote Bessemer Iron, large lots, $15.25, Valley, or $16, Pittsburgh. Small lots for prompt shipment are 15c. to 25c. a ton higher. No. 1 Foundry is $15.50 to $16, and No. 2 $15 to $15.50, Pittsburgh.

Steel.—Reports are that a deal has about been closed by which a large sized tonnage of Sheet Bars will be brought from Germany for delivery in the Pittsburgh district. The supply of prompt Steel is better and fancy prices of two or three weeks ago are no longer being paid. Occasionally a consumer of Steel offers a small lot on the market, and an Eastern mill has also appeared as a seller of a limited daily tonnage. We quote prompt Bessemer and Basic Billets at $27 to $27.50, maker's mill, Pittsburgh. Steel for delivery into first quarter and first half of next year is being freely offered at $24 to $25, Maker's mill.

Muck Bar.—A good deal of tonnage in Muck Bar is being sold on the basis of $29.50, delivered at buyer's mill, Pittsburgh.

(*By Mail.*)

There is nothing of special interest to be noted in the Iron trade at this time. The market is strong all along the line, but demand for Finished Material is perhaps not as heavy as it was during the last two or three months. The mills are making better deliveries, and the great scarcity of Material caused by the strike has largely disappeared. The Pig Iron and Billet markets are strong, but the supply of prompt Steel is better than for some time. There has been no material change in prices during the week.

Ferromanganese.—We continue to quote 80 per cent. Foreign Ferro at $50 a ton, delivered f.o.b. buyer's works, in the Pittsburgh district. Some of the local users of Ferro prefer the Foreign on account of the convenient way in which it is shipped. We quote Domestic Ferro at $52.50 in carloads and larger lots.

Rails.—Some contracts for Rails have recently been placed by Eastern roads, and the old and new orders on the books of the mills are fast approaching the 1,500,000-ton mark. We continue to quote at $28 at mill. It is reported the leading Rail interest are opposed to any advance in price.

Muck Bar.—The market for Muck Bar is firm, and Standard makes are held at $29.50 to $30, and we note sales of 3000 to 5000 tons at the first named price.

Rods.—The market is fairly strong, and we quote Bessemer Rods at $33 f.o.b. cars, Pittsburgh.

Spelter.—We quote prime Western grades of Spelter at 4.15c. to 4.20c. f.o.b. cars, Pittsburgh.

Structural Material.—The contract for the Wabash Railroad Bridge across the Monongahela River, in this city, has been placed with the American Bridge Company. It will require from 5000 to 7000 tons of material. The same road is to build a bridge across the Ohio, at Mingo Junction, and bids for its erection will be asked for in a short time. While the building season is almost over the mills are from two to three months behind in deliveries, and have practically all the work they can take care of into February and March. It is said that large interests are opposed to any advance in shapes, and for this reason the talked of advance to the basis of 1.75c. for Beams and Channels may not be made. Some heavy records of output were made in the Structural mills of the Homestead Steel Works in October. For small lots of Beams out of stock and cut to size, as high as 2c. a lb. is obtained. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Plates.—A slight improvement in demand for Plates is reported, but there is not yet enough tonnage to keep the mills filled up. It is claimed some large contracts are in sight and are expected to be placed before very long. Prices are fairly firm and we quote: Tank Plate, ¼-inch thick, up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.80c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, $1 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days.

Merchant Steel.—While demand is possibly not as heavy as it was, the mills are filled up for the next two or three months and some of them well into the first half of 1902. Buyers are having trouble in placing orders for prompt delivery on account of the crowded condition of the mills. There is no change in prices and we quote: Tire Steel, best quality, 1.70c.; Toe Calk, 1.80c. to 1.85c.; Hammered Lay Steel, 3.50c.; Open Hearth Spring, 2.50c. to 2.75c.; Steel Bars, 1.50c., base, in carloads, and 1.60c. in small lots; ordinary Plow Slabs up to 6 inches wide, 2.25c.; over 6 inches wide, 2.40c. For ordinary orders we quote Cold Rolled and Cold Drawn Shafting at 60 per cent. off in carloads and 55 per cent. off in less than carloads, delivered at all points east of the Mississippi River. We quote Tool Steel at 6c. and upward, depending on quality.

Bars.—Tonnage in both Iron and Steel Bars has fallen off to some extent, buyers having evidently come to the conclusion that the market will not be any higher. However, a lull in demand would be welcomed by the mills, as it would give them a chance to catch up on back orders. We quote Steel Bars at 1.50c., base, with $2 a ton for Open Hearth stock and the usual advances for special shapes. We quote Common Iron Bars at 1.55c. in carload lots, f.o.b. cars, Pittsburgh, but note that for prompt shipment $2 to $3 a ton advance is easily obtainable.

Sheets.—Very much prompter deliveries of Sheets are being made by the mills, but they are still from two to three months behind in orders. The demand for Sheets is not as active as it was some time ago. Jobbers quote in carload lots as follows: Nos. 10, 11 and 12,

2.40c.; Nos. 14 and 15, 2.50c.; Nos. 16 and 17, 2.60c.; Nos. 18 to 21 inclusive, 2.70c.; Nos. 22, 23 and 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.; No. 29, 3.25c.; No. 30, 3.35c. For small lots of a few bundles of Sheets and for prompt shipment No. 27 brings from 3.15c. to 3.25c., and No. 28, 3.25c. to 3.35c. We quote Galvanized Sheets at 70 and 5 off in carloads, maker's mill, and 70 off in small lots.

Skelp.—The market is fairly firm and we quote Grooved Iron Skelp at 1.80c. to 1.85c. and Sheared at 1.85c. to 1.90c., maker's mill, less 2 per cent. off for cash in 30 days from date of shipment. Prices on Steel Skelp are very firm and it is quoted about as high as Iron.

Tubular Goods.—Mills making Boiler Tubes are from two to three months behind on contracts and a heavy tonnage is being placed. There is more uniformity in prices of Tubular goods than for a long time. The mills are all quoting about the same prices. Jobbers are holding Merchant Pipe, ⅛ to ½ inch and 11 to 12 inches, in small lots, at 50 to 55 per cent. off list, and Galvanized at 40 to 45 per cent. off list. Prices made to consumers in carloads are as follows:

Merchant Pipe.

	Per cent. Black.	Per cent. Galvd.
¼ to ½ inch and 11 to 12 inch	61	48
¾ to 10 inch	68½	56

Casing, Random Lengths.

	S. & S.	I. J.
2 to 3 inch	58	53½
3¼ to 4 inch	63	59
4¼ to 12½ inch	65	61½

Casing, Cut Lengths.

	S. & S.	I. J.
2 to 3 inch	53½	59
3¼ to 4 inch	59	55
4¼ to 12½ inch	61½	57½

Boiler Tubes. Up to 22 feet.

Steel.	Per cent.
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	65½
2 inch to 2½ inch, inclusive	60
6 inch and larger	59
Iron.	
1 inch to 1½ inch and 2½ inch	43½
1¾ to 2¼ inch	43
2¾ inch to 13 inch	53

To the jobbing trade the mills quote slightly lower prices than are given above.

Iron and Steel Scrap.—A reported movement is on foot to form a combine of the principal consumers of Scrap, the idea being to control prices as much as possible and prevent dealers in Scrap charging abnormally high figures. By many the scheme is regarded as not being feasible, but it is understood a meeting is to be held on November 21 next. The Scrap market is very active, and prices are strong, especially for heavy melting stock, which is scarce, and in heavy demand. We quote it at $17 to $18 gross ton, and note that sales are reported at the higher figure. No. 1 Railroad Wrought Scrap is $16 to $16.50 net ton, and some dealers are quoting higher figures. Cast Scrap is $11.50 to $12 gross ton. Low Phosphorous Melting Stock is $19 to $20 gross ton, and is very scarce. Cast Iron Borings are $7 to $7.50 gross ton. Old Iron Rails are said to have sold at $22 at Valley mill, and are scarce.

Coke.—Coke for prompt shipment is very scarce, and some of the blast furnaces in the Mahoning and Shenango valleys, and in the Pittsburgh district as well, have been somewhat hampered by reason of not obtaining Coke as fast as needed. This is due mostly to the car shortage, and foundrymen are also having trouble in getting Coke fast enough. Large shippers do not receive more than 75 per cent. of their requirements of cars, the railroads apparently being very short of motive power. The situation has been made worse by the fact that so much rolling stock has been diverted to the Coal and Ore trades, but it is likely the supply of cars will be very much better when navigation closes. At a few of the works in the Connellsville region the supply of water is very low, and unless some rains occur there may be trouble in this direction before long. The output of Coke in the Connellsville region last week was 233,825 tons, and shipments 10,509 cars. A good deal of Coke is piled up in the region on account of cars being so scarce. Prices on Coke are very strong, and we quote strictly Connellsville furnace at $1.85 to $2, and Main Line Coke of Standard makes at $1.65 to $1.75 a ton. Strictly Connellsville 72-hour Foundry Coke is held at $2.25 to $2.50 a ton, and Main Line Foundry at $1.85 to $2 a ton. We may note that prompt Coke is bringing slightly higher prices than are quoted above.

Birmingham.

BIRMINGHAM, ALA., November 4, 1901.

The Iron market the past week was very steady and strong. Concessions were not popular and there was business enough at current market quotations to absorb the offerings. For reasons heretofore mentioned they were not large. New business for nearby deliveries is unpopular and hard to place. The deliveries on old business is what is worrying sellers now. There is not a single interest in the district that is evened up with deliveries. On the contrary every one is behind.

The car famine, to which attention has been called, still prevails and cars are hardly shunted into the loading switch when the cry of the shipper rings out for more. The railroad people are harried over the situation and run to death trying to relieve the existing conditions. But they do not improve them a bit. The simple truth is increased facilities for moving business have not kept pace with the business developments. The business done by the railroads has reached a point greater than at any previous time in their history. Stocks have materially decreased the past month. A prominent official who watches this condition closely said to your correspondent that 25,000 tons would be a very conservative estimate of the October decrease in this district. If transportation had been equal to demand it would have been greater.

Appeals to hurry shipments still continue, and a considerable share of them comes from buyers who usually are prepared for just such contingencies as now prevail by ample stock on hand. It seems as if all took the same boat and they all have the same cry of "Save me (by hurry shipment) or I perish." One interest is declining any further business for 1901 and is anxious about prompt deliveries on old business. Business keeps piling in, not in huge volume, but in a constant flowing stream, large enough to make a good healthy market at prices satisfactory to both sides.

On Friday the leading interest had to turn down important orders for Gray Forge, as they had not the stock to meet conditions of delivery. On Saturday another Gray Forge order came for 10,000 tons to another interest which is under consideration with poor prospects for acceptance. There was a sale of 1000 tons of No. 3 Foundry at $10.50, and several other smaller lots at the same price. No. 4 Foundry went at $10, No. 1 Soft sold at $12 and No. 2 Soft at $11. A very moderate amount of No. 1 Foundry sold at $12. The bulk of the sales of Gray Forge was made at $9.75 and the market was pretty well cleaned up. The price was then advanced to $10 and firmly maintained, especially by those who had none to sell. An advance has been predicted for the past three weeks, but it has been delayed by the conservatism of the larger interests. Conditions are ripe for it now, and it may be looked for at any time. Like a thunder clap in a clear sky came the announcement of the successful landing of a respectable export order. No one was more surprised than the successful seller. It goes to Great Britain. While the exact amount is withheld, it can be stated it is a multiple of 1000 tons. Railroad building in the way of extensions, branches and spur tracks still continues and the development of the entire mineral belt of Alabama is a question of a comparatively short time. The latest railroad projected is the Birmingham and Vicksburg Railroad. Though in a primitive stage now, it has fine prospects of becoming a reality.

In Coal the situation has not eased up a bit. The cry is still for more cars, and there is not a single company of consequence in the district who are not behind hundreds of cars in their deliveries. In the meantime new companies of limited capital continue to incorporate, and old companies to increase their output capacity.

The East Birmingham Machine & Foundry Company the past week sent out a train of 14 cars of machinery to

interior Mexico. The shipment went via Mobile, at which point it was loaded on vessel.

Boring for oil continues with a perseverance indicating confidence in success. While oil has been struck, it yet remains to develop a gusher.

Some stories come to us of profitable results from the gold fields east of us, and one need not be surprised to hear of fortunes secured from delving in our gold mines. It looks as if this district was "favored by heaven o'er all the world beside."

New York.

NEW YORK, November 6, 1901.

Pig Iron.—From present appearances the usual dullness during the closing months of the year will not be felt at this time. All sales agencies report the demand sufficient to keep furnace stocks very low. That consumers also have little stock on hand is shown by the constant pressure for prompt delivery. The nearby furnace companies, who usually carry considerable Iron on hand, are all reporting themselves practically bare of stocks. We quote: No. 1, $16 to $17.50; No. 2 X, $15.15 to $15.75; No. 2 Pain, $14.65 to $15; Gray Forge, $14 to $14.50; Tennessee and Alabama brands, No. 1 Foundry, $15.50 to $15.75; No. 2 Foundry, $14.75 to $15; No. 1 Soft, $15.50 to $15.75; No. 2 Soft, $14.75 to $15; No. 3 Foundry, $13.75 to $14; No. 4 Foundry, $13.50 to $13.75; Gray Forge, $13.25 to $13.50.

Cast Iron Pipe.—The City of Boston is in the market for about 6000 tons of 60-inch and 10,000 tons of 48-inch Pipe, on which bids are to be opened on the 12th inst. As previously stated, the New York Department of Water Supply will open bids for 8650 tons to-morrow. It is quite unusual for large inquiries to be in the market at this time of the year. The demand is keeping up later in the fall than ever before known. Cast Iron Pipe, tidewater delivery, is still quoted at $26 to $27 per gross ton.

Steel Rails.—Eastern and Southern railroad companies are placing orders for moderate quantities of Rails, say, from 1000 to 5000 tons, to a gratifying extent. The Eastern Rail mills are thus gradually filling up their books for next year's delivery. Standard sections continue to be quoted at $28 at Eastern mill.

Finished Iron and Steel.—The general demand, while possibly not quite so active as it has been, is nevertheless quite satisfactory. The special feature of the market is the improvement noted in the demand for Plates. This is the one particular branch in which business has latterly not been up to the wishes of the manufacturers. We quote as follows at tidewater: Beams, channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c. to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.60c. to 1.65c.; Soft Steel Bars, 1.62½c. to 1.65c.

Metal Market.

NEW YORK, November 6, 1901.

Pig Tin.—A dull and uneventful market has characterized the week under review. It was a quiet week and the amount of business transacted for consumptive account was very small. Speculative interest has been dormant. Prices have sagged throughout the entire week and at the close to-day were quoted as follows: Spot and November, 24.60c. to 25c.; December, 24c. to 24½c.; January, 23.75c. to 24¼c.; February, 24c., sellers. London is quoted £113 17s. 6d. for spot and £106 17s. 6d. for futures. According to the October statistics computed by the New York Metal Exchange the total visible supply October 31 was 194 tons above that of September 30 last year:

	Tons.
Arrivals at the Atlantic ports amounted to	2,555
Total arrivals since January 1, 1901	25,265
Of which from Straits by direct steamers	10,057
Of which from United Kingdom	13,196
Of which from Holland	1,052
Of which from European Continent	960
Exports to Europe during September	25
Total exports since January 1, 1901	412
The deliveries for October we figure as	2,600
Total deliveries since January, 1901	25,100
The shipments from Straits amounted to	3,965
Against previous month	4,435
Against October, 1900	4,140
Australia shipped	405
Against previous month	250
Against October, 1900	250
Statistics for the United States—Pacific ports excluded —October 31, 1901, show as follows:	
Stocks, including landing	2,794
Afloat	2,585
Total	5,379

The total statistics for Europe and the United States show:

	Tons.
Total visible supply, October 31, 1901	15,995
Against visible supply, September 30, 1901	17,611
Against visible supply, October 31, 1900	15,801

Copper.—Owing to the fact that no actual developments have yet occurred, interest in the situation is much more acute. Consumers are more cautious than ever, with the result that very little metal is changing hands. Large consumers are demanding of brokers that they furnish guarantee contracts with all metal purchased. Under existing conditions brokers are not anxious to make such arrangements. As to the matter of production reports are somewhat confusing. On the one hand a dispatch from Butte states that all the mines of the Boston & Montana Company and the principal producers of the Anaconda Copper Company are still closed, while there is also a material reduction in the working forces of the other companies. A conservative estimate, the dispatch says, is that by the present curtailment of operations the production of Copper has been reduced fully 75 per cent. The shut down of the Boston & Montana and Anaconda mines, which it was stated would be for a short time only, it is now said will be indefinite. On the other hand it is reported that the Calumet & Hecla is enlarging its output. This indicates the policy of that company, and that there is small prospect that the Calumet & Hecla will be a party to any arrangement for curtailing output, no matter what accumulation of Copper may exist elsewhere. The total exports for the ten months of this year are 56,369 tons below those for the corresponding period of last year. As to prices, the situation is unchanged. It is impossible to obtain spot Lake below 16.85c. to 17c. Electrolytic is quoted 16⅜c. to 16⅝c. by the principal producers, but outside producers are quoting from 16.30c. to 16⅝c. Casting stock is quoted from 15⅝c. to 16⅜c., according to brand. The London market was firm, and somewhat higher as stocks in Europe show a decrease. It closed to-day £65 12s. 6d. for spot and £64 17s. 6d. for futures. Best Selected was quoted at an advance of 10 shillings, the price being £72 10s. The exports of Domestic Copper from Atlantic ports for the month of October, as per official returns and compiled by the New York Metal Exchange, show a total exportation of 7571 long tons. The total exports since January 1, 1901, exclusive of Southern ports, for October, amounted to 77,221 tons, against 133,590 tons for the same period of 1900.

Pig Lead.—A fair business is reported in Soft Missouri at 4.25c., f.o.b. East St. Louis. Otherwise the market is extremely dull and unchanged. Purchases are on a small scale. The American Smelting & Refining Company quote 4.37½c. for Desilverized, f.o.b. New York, and 4.32½c., f.o.b. St. Louis. The London market is unchanged at £11 8s. 9d.

Spelter.—The market remains quiet, but under limited offerings spot remains firm at 4.37½c. Shipments from the West are offered, however, at 4.25c. The London market is somewhat lower again, prices being £16 12s. 6d., which is a decline of 2 shillings and 6 pence from last week's figures. Exports from this port during October amounted to 55 tons Spelter and 1740 tons Zinc Ores.

Antimony—Is unchanged. Hallett's is quoted 8⅝c. Cookson's is unchanged, being held nominally at 10¼c. Outside brands declined to 8c. to 8¼c.

Nickel—Is unchanged, prices continuing on a basis of 60c. for lots not covered by yearly contracts.

Quicksilver.—There is no change. The price is $51 per flask of 76½ lbs., in lots of 50 flasks and more.

Tin Plates.—The situation is unchanged. The American Tin Plate Company are selling only for the first quarter of next year on a basis of $4.19 per box of standard 100-lb. Cokes, f.o.b. New York, and $4, f.o.b. mills.

The New York Machinery Market.

NEW YORK, November 6, 1901.

Nothing of great significance and little of interest transpired in the vicinity of Liberty street during the week under review. Transactions were no more than commonplace and values remained unchanged. It was a good week of ordinary business. While reports gathered in the trade were not quite so rosy as at times, neither were they indicative of a feeling of depression. A sufficient number of important inquiries were received to offset any nervousness that might have been occasioned by the slack demand. In no lines were announcements made of serious shrinkage of prices. On the other hand a pretty stiff advance was made known in a certain branch. The Buffalo Forge Company, we are informed on good authority, have raised their prices 10 per cent. above list, which makes a total advance of from 12 to 15 per cent. In the cases of machine tools, engines, boilers, &c., there has been no change.

Machine Tools.

For some time past considerable interest has been taken in the trade in the movements of the National Tehuantepec Railway of Mexico. The company have been purchasing large quantities of equipment and the machine tools for the various repair shops have just recently attracted the attention of the trade. Several export houses in this city seemed to be interested in the matter and all were apparently on the "ground floor." As the quantity of machinery involved is large, there has been a general endeavor to ascertain just "who's who." At present Bock, Andrews & Co. of 27 Water street are purchasing heavily, and it is stated in the trade that the balance of the business will pass through the hands of this concern. Mr. Blau is the man in charge of the matter for this concern. A number of the tools have already been purchased, but the bulk of the machinery equipment is still open. The apparatus for the foundry and pattern shop is contracted for. All the machinery is to be electrically driven and alternating current motors are specified. We understand that a blanket contract covering all of the motors to be employed has already been awarded, or at least it is intended that one concern are to furnish all of the motors used. The shops are to be located at Coatzacoalos. S. Pearson & Son, Limited, of London, are building the road. This company are represented in this country by F. Stuart Williamson, with offices in the Broad Exchange Building, 25 Broad street, New York.

Following the announcement of the consolidation of the Acme Machine Screw Company of Hartford with the National Mfg. Company of Cleveland into the National Acme Mfg. Company comes the news that a plant will be erected in England for the building of the Acme screw machines. P. F. Pease & Co. of Worcester, England, have acquired the English patents for the manufacture of these machines. This concern, who already have extensive works at Darlington, Yorkshire, and London, will equip a new plant at Worcester for the production of the machines for the British market. The arrangements were made through the Prentiss Tool & Supply Company of New York, who have the agency for the export product of the Acme Company in all countries other than Russia.

It has again been erroneously announced that the Ingersoll-Sergeant Rock Drill Company of Easton, Pa., have decided upon a location for their new plant. We are officially advised that a report has been submitted to the directors of the company regarding the matter of new location, and that the matter rests there at present. No decision has been reached as yet.

The Mergenthaler Linotype Company, New York City, are building an eight-story fire proof building, 60 x 100 feet, adjacent to their large plant in Brooklyn, which will be devoted mainly to the manufacture of matrices for the linotype machine. The addition will be a model building, with steam heat, thorough ventilation, electric driving of all line shafts, and in addition to the ordinary tools a large number of specially designed tools, including an automatic electric micrometer, by which the smallest matrices will be tested in their several dimensions to the fraction of a thousandth of an inch, will be installed. The bulk of the machinery equipment will consist of milling machines. The matrices referred to are small brass tablets of various special shapes, which must be formed extremely accurately.

A considerable quantity of heavy machine tools and steel working machinery such as punches, shears, &c., is being purchased by the Groton Bridge Company of Groton, N. Y. A large portion of the equipment has already been purchased. We are officially advised that this concern are adding very materially to their machine shop, foundry and power house.

J. H. Coxhead of 851 Ellicot square is designing the new plant for Sidney Shepard & Co. of Buffalo, N. Y. As previously mentioned in this column, the new plant will be located in the outskirts of Buffalo. Heavy orders for machine tools, presses and special machinery will be placed. The company are manufacturers of tinware specialties, &c.

Several important changes have recently been made in the management of the Mossberg & Granville Mfg. Company, Providence. At the recent election the following who have not heretofore been associated in the management were made directors: W. W. Orr, V. I. Cumnock, E. C. Moen, A. R. Whitney, Jr., and Joseph W. Harriman, all of New York, and Elisha H. Howard of Providence. The Board of Directors organized by electing Howard C. Smith of New York, president; Elisha H. Howard, vice-president, and E. C. Moen, secretary and treasurer. V. I. Cumnock was made chairman of the Executive Committee. The resignation of W. W. Gibbs, for some time past general manager, was accepted, and in his place George A. Clark, formerly of Lowell, Mass., has been appointed. The business of the company at the present time is in a flourishing condition, and various new patterns of tools and machines have been added to their already very extensive catalogue. The New York office of the company (secretary and treasurer) is at 100 William street.

Purchases of machine tools, wood working machinery and forge shop tools are being made by Gray & Blaisdell, manufacturers of air and gas compressors, Bradford, Pa. In response to an inquiry the following information has been sent us by the company: "We have under way a plant consisting of a machine shop, 100 x 140, of steel and brick, to be equipped with a 20-ton crane, a power house and forge shop building, 30 x 120, and a pattern shop, 40 x 50, two stories. All buildings are of steel, brick and glass, lighted by electricity, and electric transmission of power will be used throughout. The entire equipment is new and strictly modern; part has been purchased. Our motive power will be gas engines with direct connected generators."

We are advised that the Boston offices of the Niles Tool Works Company, Bement, Miles & Co. and the Pond Machine Tool Company have been removed to 144 Pearl street. Chas. H. Kingsbury is the local manager in charge.

Boilers and Engines, &c.

Interesting advance information regarding projected plants and a good inquiry, maintained the general tone of the market. As to actual transactions during the week none were reported that were of any considerable interest. In relation to prices conditions remain unchanged. The builders of heavy engines have their shops well filled ahead and therefore are very firm. Among the builders of smaller sized units there has been considerable cutting for some time. This still continues. Exactly the same condition marks the boiler trade.

It is reported in the trade that R. H. Tingley, consulting engineer, 32 Broadway, New York, has an extensive electric street railway project in hand. The plant is to be erected in the vicinity of Ballston, N. Y.

The Hopewell Electric Light & Power Company of Princeton, N. J., are preparing for the erection of a new plant at that point. Mr. Fitch is in charge of the matter.

Plans are being prepared for a 1500 horse-power plant to be erected at Auburn, N. Y., by the Auburn Interurban Electric Power Company of Auburn, N. Y. R. A.

Dyer, Jr., is the superintendent of the company and has the matter in hand. Purchases will soon be made.

Houston Barnard of Rochester, N. Y., is said to be promoting a project looking toward the erection of a very extensive electric lighting plant for Batavia, N. Y. The proposition is still in its embryotic stages.

Orders have been placed with the Watertown Engine Company for steam engines for the electric light plant at the Hudson River State Hospital. This makes the tenth engine and the sixth installation of Watertown work in State asylums and hospitals.

We are informed by G. O. Bridgman, president of the village of Boonville, N. Y., that a full equipment for a water power electric plant will soon be contracted for and the details in connection with the designing of the plant are now being perfected.

Will & Baumer of Syracuse, N. Y., are in the market for a very extensive power plant equipment, as well as a large amount of special machinery. The concern are refiners of beeswax and tallow, and their plant was recently destroyed by fire. It is intended to commence rebuilding within 30 days.

J. Keith Fisher of the Pacific Coast Portland Cement Company, whose offices are located at 66 Broadway, New York, has returned from England, and is now purchasing the equipment for the new plant which the company are to erect at Vancouver, B. C. The machinery is to be electrically operated. A large equipment will be required.

The Schubert Piano Company of 134th street, New York, who are erecting a new plant, have placed an order with the Buffalo Forge Company for an extensive heating plant. Included in the equipment is an 8½-foot blast wheel direct connected to an engine and 7000 feet of heating coils. The latter concern have also received an order from the Union Brewing Company of Newark, N. J., for a high speed electric light engine direct connected to a Sprague generator.

The New Process Raw Hide Company, Syracuse, N. Y., through their English agents, Geo. Angus & Co., have received during the month of October trial orders for their New Process noiseless pinions from 11 of the leading electric railway companies in Great Britain. These trial orders will doubtless lead to a considerable trade in the near future. The company report their trade in the general machinery line as steadily increasing, especially in the case of motor driven machine tools, where noiselessness is very essential. Since the company's announcement a couple of months ago that they are in position to furnish accurately cut metal gears also, the number of orders received for work in this line has been very gratifying and points favorably to an extended trade.

Naval Supplies

Following are the awards made by the Navy Department for machinery and supplies for installation in the Puget Sound Navy Yard, as the result of bids opened October 15:

Class 1. Eighteen lots hexagon nuts, Daniel A. Lowber, New York, $926.20.
Class 5. One lot screws, Manhattan Supply Company, New York, $682.30.
Class 19. Lot drills, reamers, taps, &c., Francis Harrell, New York, $914.48.
Class 23. Four 18-inch swing, 8-foot bed screw cutting engine lathes, Manning, Maxwell & Moore, New York, $2144.
Class 24. One automatic bevel gear planing machine, Parke & Lacy, San Francisco, $1491.
Class 25. One automatic gear cutting machine, Pacific Tool & Supply Company, San Francisco, $1895.
Class 26.—One universal milling Machine, Manning, Maxwell & Moore, New York, $685.
Class 27. One double head boring and turning mill, Prentiss Tool & Supply Company, New York, $2250.
Class 28. One 2 x 24 inch flat turret lathe, Parke & Lacy Company, San Francisco, $1231.
Class 29.—One pipe cutting and threading machine, W. A. Foster, New York, $750.
Class 30. One four-spindle tapping machine, Handien & Buck Company, St. Louis, $400.
Class 32. One 28-inch shaper, Manning, Maxwell & Moore, New York, $725.
Class 33. Two 20 horse-power stationary motors, Parke & Lacy Company, San Francisco, $562.
Class 35. One continuous motion riveting machine, Handien & Buck Company, St. Louis, $1500.
Class 36. One boiler makers' flanging clamp, Manning, Maxwell & Moore, New York, $350.
Class 37. One foundry cupola, Northern Engineering Works, Detroit, $949.
Class 38. One 10-ton jib crane, Browning Engineering Company, Cleveland, $925.
Class 39. One positive pressure blower, Manning, Maxwell & Moore, New York, $1215.
Class 40. One inclinable power press, Tatum & Bowen, San Francisco, $189.
Class 41. One rotary slitting shear, Prentiss Tool & Supply Company, New York, $345.
Class 42. One power squaring shear, Henshaw, Bulkley & Co., San Francisco, $760.
Class 43. One 8-inch power brake, George A. Ohl, Newark, N. J., $1365.
Class 44. One pneumatic hammer, Henshaw, Bulkley & Co., San Francisco, $480.
Class 45. One wood boring machine, Henshaw, Bulkley & Co., San Francisco, $153.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, until November 26, to furnish at the navy yard, Puget Sound, Wash., boiler, pump, condenser, generating sets, motors, machine tools, electrotyping outfit, ammeters, voltmeters, tachometers, photometers, testing set, gauges, indicators, instruments, tools, shafting and iron pipe. Blank proposals will be furnished upon application to the navy yard, Puget Sound, Wash., or to the Bureau. A. S. Kenny, paymaster general, United States Navy.

Bids were received by Mordecai T. Endicott, Chief of Bureau of Yards and Docks, Navy Department, October 26, for the construction of a coaling plant at the navy yard, Washington, D. C., as follows:

Item 1, for the work complete as specified: 2, alternate proposal in case amount exceeds the $39,000 available..

C. W. Hunt Company, West New Brighton, N. Y., item 1, $38,750.

John A. Mead Mfg. Company, New York City, item 1, $33,505, or $39,459 with creosote piles; if allowed 11 more days for time of completion, $39,105; 2, $99,000, $99,455, $99,320; time, four months.

Following are the bids received at the Bureau of Supplies and Accounts, Navy Department, for the machinery for installation in the Norfolk, Va., navy yard, included in bids opened on October 29:

Bidder 4. Wm. Sellers & Co., Incorporated, Philadelphia.
9. Manning, Maxwell & Moore, New York.
11. E. J. Etting, Philadelphia.
22. Fox Bros. & Co., New York.
36. Smith-Courtney Company, Norfolk, Va.
46. Bement, Miles & Co., Philadelphia.
61. Niles Tool Works Company, Hamilton, Ohio.
64. Henry Walker Company, Norfolk, Va.

Class 50. One steam hammer, single frame, upright, 400 to 600 pounds—Bidder 46, $695; 9, $750; 4, $840.
Class 51. One do., 2500 pounds—Bidder 9, $1995; 46, $1995; 4, $2720.
Class 52. One do., 6000 pounds—Bidder 46, $3874; 9, $4095; 4, $5470.
Class 53. One jib crane—Bidder 11, $2500; 4, $3485.
Class 54. One forge equipment—Bidder 36, $1625; 64, $1699; 11, $1837.50; 22, $1924.
Class 55. One box bed upsetting and forging machine—Bidder 64, $1549; 36, $1645; 61, $1894.
Class 56. One alligator shear—Bidder 64, $390; 36, $420; 61, $547.

Information Wanted.—A correspondent wishes data concerning losses in melting by oxidation, &c., of yellow brass, red brass and bronze metal reduced in No. 18 crucibles.

A press dispatch from Birmingham, Ala., states that the wages of 10,000 Alabama miners have been advanced 2½ cents per ton, owing to the recent advance in the price of pig iron, the average for all grades being last month a little over $10 per ton. The miners will receive 52½ cents per ton. The advance will apply from November 1.

The report which has been given considerable circulation purporting that James W. Brown of the Colonial Steel Company was elected first vice-president of the Crucible Steel Company of America is incorrect. Mr. Brown is president of the Colonial Steel Company of Pittsburgh and has no connection whatever with the Crucible Steel Company of America.

To Build Mining Machinery.

The Holthoff Machinery Company, incorporated October 19 with a capital stock of $600,000, $300,000 of which has been subscribed and paid in, have purchased a site at Cudahy, Wis., a suburb of Milwaukee, where they have already broken ground for the erection of a new plant. Plans are now being completed for a machine shop, 250 x 110 feet; a boiler and sheet metal shop, 250 x 100 feet, and a foundry, 250 x 100 feet, with a wood working and pattern shop, 120 x 60 feet. A two-story office building, 80 x 32 feet, will also be erected. The machinery employed will be especially designed for the building of high grade mining and metallurgical machinery. The shops when completed will cover about 15 acres of ground. The officers are W. D. Gray, president; Henry C. Holthoff, vice-president and general manager, and B. T. Leuzarder, secretary, treasurer and business manager. All the officers were for many years connected with the E. P. Allis Company. The directors are W. D. Gray, Henry C. Holthoff, B. T. Leuzarder, Patrick Cudahy, president of the Cudahy Bros. Packing Company; Isaac D. Adler, Fred. C. Pritzlaff, president of the John Pritzlaff Hardware Company, and Thomas Jefferson Pereles.

Iron and Industrial Stocks.

Fractional advances in almost all lines of industrial stocks marked a reversal of the conditions of the week previous. The market, though devoid of features of especial interest, remained steady, and in some instances values increased daily by fractions. Owing to the favorable statement issued a week ago Pressed Steel continued to advance throughout the entire week. The common stock made a net gain of two points, while the preferred increased to a similar extent. Tennessee Coal & Iron gained a point, as did also United States Steel, both in respect to common and preferred. Trading was on a rather moderate scale in all lines, excepting Pressed Steel Car and United States Steel. Here the transactions ran somewhat heavier. The rumors that the United States Steel Corporation's underwriting syndicate was about to be dissolved were denied. It is said that the syndicate will continue until next May. It is also reported that a premium of 25 per cent. has been bid for existing subscription rights in the syndicate.

At the annual meeting of the stockholders of the Electric Vehicle Company the number of directors was reduced from 13 to 9. The following retiring members were re-elected: H. M. Byllesby, George Chapman, G. H. Day, P. T. Dodge, T. W. Goodridge, Albert A. Pope, A. L. River, I. L. Rice and F. C. Stevens.

At a special meeting of the stockholders of the American Bicycle Company it was voted to reduce the authorized capital stock from $80,000,000 to the amount now listed at the Stock Exchange—namely, $9,294,000 preferred and $17,701,500 common; total, $26,996,400. The actual reduction is comparatively small, as of the $80,000,000 authorized only $30,000,000 has been issued.

Following is the four months' statement issued on November 1 by the American Car & Foundry Company:

Earnings.

Balance as per second annual report for year ending April 30, 1901	$5,074,949
Net earnings for four months ended August 31, 1901.	1,086,865
Total	$6,161,814

Disposition of Same.

Dividends of $30,000,000 preferred capital stock:		
No. 9, 1¾ per cent., paid August 1, 1901	$525,000	
No. 10, 1¾ per cent., paid November 1, 1901	525,000	
		$1,050,000
Dividends on $30,000,000 common capital stock:		
No. 5, ½ per cent., paid August 1, 1901	$150,000	
No. 6, ½ per cent., paid November 1, 1901	150,000	
		$300,000
Total		$1,350,000
Balance August 31, 1901		$4,811,814

The Pocahontas Coal Company completed their land purchases last week by taking up the option on the remaining 70,000 acres. A week ago the company took over and paid for about 230,000 acres. In all, they now own about 300,000 acres, together with railroad franchises and other valuable concessions.

The underwriting has not as yet been completed.

OBITUARY.

JAMES P. KENNEDY.

James P. Kennedy, one of the organizers of the American Bridge Company, died at his residence in Youngstown, Ohio, on Monday morning, November 4, of heart failure. Mr. Kennedy was a son of Henderson G. Kennedy, and was born in Mahoning County, Ohio, August 25, 1861. He was educated in the Youngstown public schools, and directly after finishing his studies entered the office of the old *Register*, which soon after was consolidated with the Youngstown *News*. He was retained as business manager of the concern, and continued to fill that office with much satisfaction until 1882, when he tendered his resignation and entered the employ of the Andrews Brothers Company in the capacity of bookkeeper. After faithfully serving this company for nine years Mr. Kennedy assumed the duties of manager of the then Youngstown Bridge Company, and to his sound judgment, strict adherence to business and splendid executive ability may well be attributed the positive success which has come to this enterprise. Mr. Kennedy took a very prominent part in the formation of the American Bridge Company, and served as one of the leading officers for a year or more. He held a responsible position with the company at the time of his death.

NOTES.

DEXTER W. GOODELL of Greenfield, Mass., died on October 27 of Bright's disease, aged 64 years. He was formerly a member of the firm of Goodell Brothers, manufacturers of tools in Greenfield and later manufactured on his own account in Springfield, Mass. Mr. Goodell was an inventor of some note.

JAMES BARCLAY HENNEY, superintendent of the Manchester Locomotive Works, Manchester, N. H., died suddenly on November 3, from heart disease, aged 60 years. Mr. Henney had been connected for a long time with the American Locomotive Works at Hartford, Conn., the company now controlling the Manchester plant, and had only taken charge of the latter about a week before his death.

A deplorable outrage occurred at Columbia, S. C., on Saturday night. Two nonunion machinists employed in the Southern Railway shops were attacked at home some time after midnight by a party of men recognized by the former as strikers. One of the nonunion men was killed and the other fatally wounded. Two of the assailants were arrested and the others are being hunted. The Southern Railway Company are making every effort to have all the criminals apprehended.

The contract for furnishing the navy with nickel steel forgings has been awarded to the Fore River Ship & Engine Building Company at 29.5 cents for 3-inch and 18.9 cents for 4-inch.

A special meeting of stockholders of the H. H. Franklin Mfg. Company will be held on the 14th inst. at the office of the company, in the city of Syracuse, N. Y., for the purpose of voting upon a proposition to increase the authorized capital stock from $100,000 to $250,000, and upon another proposition to authorize an extension of the business and powers and rights of the corporation, so as to include the manufacture and sale of automobiles.

The Pullman Palace Car Company are building a very handsome private car for Charles M. Schwab, president of the United States Steel Corporation. The car will be ready in a short time and will be named for Mr. Schwab's wife.

The new tube mill of the Carnegie Tube Company, at Carnegie, Pa., is nearly completed and the company expect to be making tubes about November 15.

Nevin McConnell, formerly superintendent of the open hearth steel department of the Sharon Steel Company, has connected himself in a similar capacity with the Union Steel Company of Pittsburgh.

The Chicago and Northwestern Machinery Market.

CHICAGO, ILL., November 2, 1901.

The condition of the machinery trade continues very satisfactory. All branches report a steady influx of orders with bright prospects for the future.

Engines.

The Allis-Chalmers Company of Chicago say that the various plants of the company are running to their fullest capacity day and night, and the new plant in course of erection at Milwaukee is being pushed to completion as rapidly as possible, this being necessary on account of the great volume of business they have entered upon their books. Since receiving the order for the eight engines rated at 8000 horse-power minimum capacity for the New York Rapid Transit Railway, better known as the Subway, they have received a number of large engine contracts, among which can be mentioned the sale of three vertical cross compound condensing engines, with a rating of 1700 horse-power each, for the Mohawk Valley Power Company, to furnish power for the Fonda, Johnstown & Gloversville Railway Company power house to be erected near Amsterdam, N. Y. This power plant will be furnished complete in every particular, and was designed and purchased by Chas. H. Ledlie, consulting engineer, of St. Louis. They have also recently received an order for a complete saw mill for Sydney, New South Wales, and a large volume of mining machinery to be shipped to foreign countries. Among other orders of importance booked recently may be mentioned the following: Wheeling Steel & Iron Company, Wheeling, W. Va., one blowing engine, with cylinders 44 and 84 x 60 inches; Pittsburgh, McKeesport and Connellsville Railway Company, three vertical cross compound direct coupled engines, with cylinders 28 and 56 x 48 inches; London United Tramways, London, England, one cross compound engine, with cylinders 26 and 54 x 48 inches; Henderson Cotton Mills, Henderson, Ky., one engine, with cylinders 26 x 48 inches; American Hide & Leather Company, Chicago, one engine, with cylinders 26 x 48 inches; Fair Haven & Westville Railway Company, New Haven, Conn., two vertical cross compound direct coupled engines, with cylinders 26 and 54 x 48 inches.

Charter Gas Engine Company, Sterling, Ill., say their business for the month of October has been as good as they could ask for, and, indeed, it has been more a question of filling than of obtaining orders. To illustrate, they say that in the last week they have booked orders for engines from Massachusetts, New York, Pennsylvania, Georgia, Texas, South Dakota, Kansas, as well as many from Illinois and adjoining States. These orders are for engines and do not cover repairs, which the company do not seek. They feel that this condition will obtain through the winter and if it does they will not get any opportunity of laying in stock for the spring trade.

Quincy Engine Works, Quincy, Ill., say that although their new plant is hardly under roof, they received a number of inquiries for large engines and heavy machinery during the month of October. Their plant is now so near completion that they can name satisfactory deliveries, and they believe the immediate future promises good business.

Marinette Iron Works Mfg. Company, Marinette, Wis., say they have done a normal amount of business during October, securing some large contracts for gas engines, and find prospects for increased business for next year all that could be desired. They have now on hand orders for about 50 engines, ranging from 25 to 125 horse-power.

Pumps.

Union Steam Pump Company, Battle Creek, Mich., say that it was their impression four years ago that business was all they could desire or expect it to be, but it is better now than at that time. They are making a shipment abroad of a large jet condenser, a large air compressor for a foreign electric light company and several auxiliary pumps for a foreign shipbuilding concern. They are also shipping some 20 mining pumps for the Lake Superior district. These are only a few in the heavy sizes. They have already booked orders for future delivery of 2400 boiler feed pumps, and the season has hardly commenced.

American Steam Pump Company, Battle Creek, Mich., find trade conditions gradually improving and business for the year bids fair to show an increase of 20 per cent. over that of 1900. Regarding the immediate future they can see no reason why the prosperous condition of the country should not continue and increase during 1902.

The Gardner Governor Company, Quincy, Ill., state that it has been the history of their business for several years past that the month of October is usually the leading month of the year. This year's October is no exception to the rule. The demand has kept ahead of the supply, and their capacities have been taxed to the utmost, notwithstanding their machinery equipments and working force have been augmented materially. The pump business has been especially pleasing. They have sent out some very large pumps, among them the following: Two 750,000-gallon compound pumps for the water works at Newkirk, Oklahoma. One, each, 1,000,000-gallon compounds to Joplin, Mo., and Boyne City, Mich; two large brine pumps to Philadelphia, one 1,500,000-gallon Underwriter pump to a packing house in Kansas City and 2,000,000-gallon pressure pump to the Keith & Perry Building in Kansas City, to be used for elevator work. They also received a handsome export order from Australia and a number of calls for the smaller size boiler feed patterns. Their governor and air compressor departments are both receiving their full share of business, and the outlook is quite promising indeed.

Power Transmitting Machinery.

Dodge Mfg. Company, Mishawaka, Ind., report a very full inquiry and express regret that they are able to accept but a limited percentage of the new business at this time. Their new foundry and machine shop are being occupied and already overflowing with satisfactory work. The inquiries would indicate a very flattering condition of affairs with the manufacturing public, as in their line this means increasing of present facilities and a very large percentage of entirely new plant construction. There is also a tendency to advancing prices, both in supplies and finished products. The first half of 1902 seems to be well covered in many lines with which they come in contact.

Webster Mfg. Company, Chicago, say that the condition of the machinery trade from their standpoint is very good. They have unfilled orders on their books for about $300,000. Some of their late important contracts are the entire machinery for the large grain elevator which the New York Central Railroad Company are building at Weehawken, the machinery for the improvement in the Illinois Central Railroad elevator in Chicago, the conveying machinery for the Edison Cement Works in New Jersey, machinery for large cement works to be built by Alsen & Co., in New York. They also have the contract for the machinery in the large glucose plant being put up in New York City by people associated with the Standard Oil Company. They have advance work to run them for six months to come at least.

Stephens, Adamson & Co., Aurora, Ill., say they have been very busy during the month of October and have orders ahead which will keep their factory running for the next 90 days. The demand from the country trade, especially among the flour mills, grain elevators, &c., has quieted somewhat during the past month, but there is an increased demand for their line from manufacturing plants and factories of different kinds in the manufacturing centers. There is every prospect that their shop will be running full time during the winter months.

Machine Tools.

The Kempsmith Mfg. Company, Milwaukee, Wis., report that the months of August, September and October have been eminently satisfactory to them. In the business throughout the country there seems to have been a steady and wholesome increase, and their anticipation, based upon inquiries, is that November will outstrip its

predecessors. They have no satisfactory basis upon which to base any opinion as to the length of time their present healthy output will continue, but they express the hope that for the next year at least the machinery business will continue as it has the past year.

McDowell, Stocker & Co., Chicago, say that their business for the past month has been very satisfactory, and while they have not booked as large a volume of business as they did the previous month, yet from the point of orders received their trade has been better than it was in September. The prospect for business in the immediate future is very flattering; there is plenty of new business to figure on, and they do not see any indication of a let up for the next few months.

Perry Ransom, Oshkosh, Wis., report that during the past month they have secured orders for quite a number of grinding machines for the new shops of the Allis-Chalmers Company. They have also secured an order from the Lodge & Shipley Tool Company for an exceptionally large disk grinder, dimensions, 27 inches. They have booked several good orders from the Pacific Coast. They refer to the outlook for the coming winter as being better than they have ever known it.

Wickes Brothers, Saginaw, Mich., report that their business for the past month has been particularly good, and all indications point to a continuance of the present satisfactory state of affairs. They have made several sales of new tools they are bringing out, notably a 30-foot pit lathe and 60-inch engine lathe. Trade has been so good lately that they have been again compelled to increase their facilities, and are now constructing a steel frame machine shop, 80 x 200 feet, equipped with electric traveling cranes and the very best appliances throughout.

Marshall & Huschart Machinery Company, Chicago, report their business for October is about regular and in its normal stage. Prospects are good, and they will be satisfied if the next 12 months are as good as October.

John H. Dawson, successor to Dawson & Goodwin, Chicago, reports business for the month of October remarkably good, much better than previous months. The orders have been scattered without any specially large sales, but a good many of them. He is now carrying a line of the Becker-Brainard Milling Machine Company's plain and universal millers, automatic gear cutters and Becker vertical millers, and has just closed a contract with the W. P. Davis Machine Company, Rochester, N. Y., to carry a full line of their lathes, keyseater, &c. He has recently made extensive purchases of second-hand machines, for which he finds a greater demand than he can supply, especially in the larger size tools. He has recently taken the second floor of the building, besides having a large storage capacity outside. From present indications he believes that business will be good for the next two or three years at least.

The Wilmarth & Morman Company, Grand Rapids, Mich., have, during the past week, made the following shipments of their new Yankee drill grinders: Three each to Bombay and Calcutta, India; one to Rangoon, Burma; one to Singapore; one to Hong Kong, and three to Shanghai, China; one to Manila, P. I.; one to Montreal, Canada, and one to the University of Wisconsin at Madison. In addition to the four style N wet drill grinders with self contained motor shipped last week to the United States Government, one will go to the Allis-Chalmers Company, Milwaukee, and one to the Niles-Bement-Pond Company, at Plainfield, N. J.

New Doty Mfg. Company, Janesville, Wis., say their business is in excellent condition, and they have all that they can do continually. Prospects are good for the future.

Cranes and Hoists.

American Hoist & Derrick Company, St. Paul, Minn., advise us that business continues extremely good, and shows 20 per cent. increase in volume over the same period for last year. They believe there is no great liability of any decline during the next 12 months. They look for another year of the best business with which a community was ever favored. There is nothing especially notable in any of their recent shipments, with perhaps the exception of a large derrick plant recently forwarded to Manila to be used in constructing the harbor improvements at that point on the contract recently closed between the United States Government and the Atlantic, Gulf & Pacific Company.

Industrial Works, Bay City, Mich., state that there is no departure from the heavy business which they have been doing for the past three years. Orders during September and October have been unusually large, and they can see nothing to indicate anything else in the future, so far as their business is concerned. Their plant, with its large capacity, has now been running day and night for over three years, and this seems likely to continue in the future.

Miscellaneous.

The Stover Mfg. Company, Freeport, Ill., say the month of October has been an exceedingly good one with them. The demands have been greater than their ability to supply and the prospect for the future is most promising. Their business for the year will run about 50 per cent. greater than any in their history, and they could have made it very much larger had they been favored with facilities great enough to make goods sufficient to meet the wants of their trade. The conditions this year have been peculiarly favorable to the sale of wind mills and feed grinders. The generally prosperous condition of the country leads them to believe that there will be a good demand for their line of goods another year.

Novelty Iron Works, Dubuque, Iowa, report that orders during the month of October have not reached the usual volume, but during the latter part of the month trade has been materially increased, especially in the shingle machinery department. These goods are now in demand throughout the South, and from the increased volume of correspondence from that quarter they look for a good trade. The fall season has been somewhat dull with them in the trip hammer trade owing to the severe drought during the summer months. They believe they have received their share of the orders, however, and have no cause for complaint, having had considerable inquiry from blacksmiths of small means who have use for a hand power trip hammer.

Northern Electrical Mfg. Company, Madison, Wis., say they are extremely busy and to such an extent that it is necessary for them to more than double the capacity of their shops, which improvements are now under way. They do not recognize any conditions which would lead them to think that there is likely to be any immediate check in the demand for their line of goods. They regard the outlook as very favorable and encouraging.

The D. Clint Prescott Company, Menominee, Mich., report that their business is increasing all the time and that they have orders on hand to keep them running night and day for several months. Their business this fall is just double what it was last fall.

Joseph T. Ryerson & Son, Chicago, report that orders and inquiries covering heavy machinery for the past 30 or 60 days indicate a continuance of conditions which they reported in the summer. Boiler makers and tank builders seem to be awakening more than ever to the necessities of modernizing their plants and equipping them to meet any increasing demand for heavy work. Among recent sales they report Lennox bevel and rotary splitting shears and other boilermakers' machinery to the following: Anaconda Copper Mining Company, Anaconda, Mont.; E. Keeler Company, Williamsport, Pa.; Texas & Pacific Railway Company, St. Louis, Mo.; Joseph Cody & Son, Peoria, Ill.; United Boiler Company, Girard, Ohio; Crescent Ship Yard, Elizabethport, N. J.; R. D. Wood & Co., Philadelphia, Pa.; Standard Oil Company, Buffalo, N. Y.; Stacey Mfg. Company, Cincinnati, Ohio; Payne & Joubert, New Orleans, La.; Henry Seiders, E. Stroudsburg, Pa.; Farrar & Trefts, Buffalo, N. Y.; S. Freeman & Sons Mfg. Company, Racine, Wis.; F. G. Fernstrum, Menominee, Mich.; Minneapolis Threshing Machine Company, Minneapolis, Minn.; Northwestern Steam Boiler Works, Duluth, Minn., and others. They also report sales of heavy hydraulic riveters and equipments to the Willamette Iron Works Company, Portland, Ore.; S. Freeman & Sons Mfg. Company, Racine, Wis., and additional equipment to Broderick & Quinlain, Montpelier, Ind.

Stover Novelty Works, Freeport, Ill., report that their business continues to improve every month. This is especially true in their special wire forming machines and also in their regular line of drills and power hack saws. They have received large contracts for wire bending machines and other special machines, on which they have gained a well established reputation. The outlook for the future is bright.

Chicago House Wrecking Company, Chicago, say they have been surprised at the large number of prospective buyers there are in the field. Inquiries are received at an increasing pace, and it keeps them busy answering their correspondence. Their business, taken as a whole, has been entirely satisfactory and they feel they are safe in saying the prospects for the continued sale of machinery are very encouraging. They have just finished a comparison of their sales of machinery, and find that they have actually sold just three times as much during the month of October, 1901, that they did in the same period 1900. During the past month they have made many sales of small outfits and quite a number of medium sized ones. Among the more prominent they made the following, viz.: To a large mining company in Montana several large hoisting engines, as well as boilers, engines, electrical material, piping, &c. To a large irrigating concern in Louisiana one 16 x 36 Corliss engine, centrifugal pump, 150 horse-power boiler—in fact, a complete plant. To a large brick making plant in Michigan a water tube boiler, high speed automatic engine, &c. To a large foundry in New York a pair of automatic Williams engines. To a large oil company in Alabama a fire box boiler, centrifugal pump, and a high speed engine. Also one diamond prospecting core drill to a prospecting concern in Illinois. They have also installed quite a large number of wood working plants, as well as several large electric light plants. They recently sold a large mining company in Central Mexico a complete mining outfit, consisting of boilers, engine, hoisting machinery, rock drills and an air compressor. The company are securing quite a number of foreign inquiries for hoisting engines and machinery and supplies in general, the largest demand coming from the small republics of South America.

St. Louis Machinery Market.

ST. LOUIS, MO., November 2, 1901.

Conditions in the machinery and metal working trades in this locality have not changed materially within the last month. The only variation that might be noticed is the state of trade with the jobbers. There seems to have been a slight let up in the strong demand that so characterized the hot summer months. Inquiries, however, are very numerous, and the prospective business appears very flattering. The machinery manufacturing plants, on the other hand, are still crowded with orders, and, with such a state, it is only to be expected that the present lull in the business, now being felt by jobbers, will revive in time to keep pace with the growing condition in the shops.

A number of new manufacturing concerns and new additions to old equipments are fast materializing. The vast amount of work that must be done in the erection and installation of the now famous exposition to be held here in 1903 in commemoration of the Louisiana Purchase is causing many new enterprises to be launched. It is acknowledged by many manufacturers that their manufacturing plants are now crowded to almost their full capacity with orders from ordinary business channels, enough to keep them busy, possibly 6 to 12 months in many cases. It is consequently hard to see how they will be able to take care of the new contracts for all kinds of material and equipment that will be called for in the construction of this fair, unless there is a wonderful reaction in the business coming from other sources. This latter condition is hardly probable on account of the solid foundation that has just been laid for all undertakings planned by this city.

St. Louis itself has taken the lead, a new charter has been adopted and a new epoch started in its history. This charter provides for millions of dollars to be spent in building boulevards, paving streets and the making of new sewers. Labor is even now well employed, and the call for more workers will not cease in the face of such undertakings.

The building operations already show an increase of 100 per cent. over last year. Steel structures are building and many more are being planned, the iron interest being accordingly affected. The multitude of wood constructed buildings have also their indirect effect upon the machinery interest. New saw mills are being erected throughout the Southwest, especially in Arkansas, to supply the increased call for lumber. St. Louis is supplying the major portion of machinery for these mills. This great commercial growth of St. Louis is attracting widespread attention, and the reason is not far off, for during the first nine months of this year 67 local corporations have increased their capital stock to the extent of nearly $9,000,000, or more than 80 per cent.

The state of the local market as regards power machinery is well shown by the following interview the representative of *The Iron Age* had with N. O. Nelson, president of the N. O. Nelson Mfg. Company: "This year has been an unusually active one in all of our lines. Up to October 1 our four factories at Leclaire, Ill., had an output of 47 per cent. ahead of the same period for 1899, and 38 per cent. above the same period last year. We have added materially to the equipment, and have worked part overtime, and a night gang in the machine shop. The demand for pipe machines has been especially large, the output being practically double that of 1899, or any year previous thereto. Prices of our material for buildings has been well maintained, most of them showing advances of from 10 to 20 per cent. At our Bessemer, Ala., pipe foundry we have been steadily busy, the demand keeping up with our full output.

"We have had no trouble with labor at any of our factories. Since starting the nine-hour day May 1, without making any change in the day rate of wages, we find that the percentage of labor cost to output is, up to October 1, somewhat less than the record for either of the preceding two years. When we announced the nine-hour day without change in pay to a meeting of the men we took a vote on whether they believed we could do as much in nine hours as in ten. There was, of course, a unanimous affirmative vote. We believe our mechanics have in good faith been trying to carry it out, and the record so far looks like they have succeeded."

More special machinery seems to be in course of manufacture here than for some time past. These are all new manufacturing products, and, while experimental in some cases, they will in a majority of instances add materially to the machinery produced in this locality. Several large contracts have recently been let, and much large business of this nature is in sight. The Ranz-Lambrecht Machine Company have a large contract for making a new automatic mail stamping machine, also an order for some high class work in connection with a large die order. New patent street car fenders are always being devised, and this firm are making what they consider a perfect one.

The Charles Sinning Machine Company are busy perfecting a new four-cylinder rotary engine for a large local concern. This firm are also manufacturing the new Davis adding machine, soon to be placed on the market. They are just finishing the complete rearranging and replacing of all the shoe machinery in the mammoth shoe factory of the Hamilton-Brown Shoe Company, said to be the largest factory in the world. This company are figuring on much new work, and expect to be very busy from now on for the next year.

The Curtis & Co. Mfg. Company have orders on their books sufficient to keep them busy for months. Their new air hoist and traveling crane, together with air compressors, have been meeting with high favor. They have installed many plants with this equipment, among which are the American Ice & Coal Company, of the Anheuser-Busch Brewing Association, the Griesedieck Ice Company and the Heim Brewing Company, these air hoists and cranes being used for raising and carrying the ice in their plants instead of using the former pulley arrangement worked by hand. This com-

pany have furnished 12 air hoists to be used at the works of Shickle-Harrison & Howard Iron Works. The saw mill machinery and other specialty departments of this company's business have been crowded with orders, and the year's business will show a material increase over former years.

The Central Union Brass Company are enjoying a continued steady run in their brass foundry. Their chief specialties are confined to the overhead equipment for electric railway construction. One of the most successful and much needed inventions in street railway work has just been placed on the market by this company. It is a trolley wire pick-up, to be placed on all street cars, and used in case of emergency where the trolley wire breaks. This new appliance is meeting with almost universal use, and foreign orders are pouring in upon them.

A New Tin Plate Enterprise.—On October 31 there were incorporated under the laws of the State of New Jersey the International Tin Plate Corporation, with a nominal capital of $100,000. The title of the corporation indicates their purpose to manufacture in Europe, the United States and Canada. H. Herbert Andrew, J.P., managing director of J. H. Andrew & Co., Limited (Toledo Steel Works), Sheffield, England, one of the largest makers of fine steels in Europe, represents the foreign interests of the corporation, which is indorsed by Lord Charles Beresford, who has inspected the system and is chairman of Mr. Andrew's English company. This corporation will operate under the inventions of Messrs. Andrew and Allis, known as the Allis-Andrew system, which is protected by numerous patents granted in the United States and abroad. The domestic affairs are looked after by their president, Thomas V. Allis of Bridgeport, Conn., where the system was developed.

The Gruson Works in Operation.—The large plant of the Gruson Iron Works, at Eddystone, Pa., which has been under construction for some time, was put in operation October 21, with enough orders on hand to keep it running full for some time to come. The company will produce all kinds of heavy castings for the trade, making a specialty of chilled iron castings. The works were erected for the purpose of ultimately producing the Gruson chilled iron segmental coast defense turrets. These turrets are at present built at the Magdeburg plant of the Krupp Company in Germany. It is intended to introduce them in this country.

Some Edgar Thomson Records.—In the month of October just closed the Edgar Thomson Steel Works of the Carnegie Steel Company, at Bessemer, Pa., Thomas Morrison, general superintendent, made some phenomenal records for production, greatly exceeding best previous records. The total output of ingots at these works in October was 82,256 gross tons. The output of blooms was 71,673 gross tons, and the output of finished rails 67,236 gross tons. The best previous record at these works was 61,827 gross tons of rails made in April of this year. One of the blast furnaces is also doing some remarkable work. These records certainly speak well for the efficient management of the Edgar Thomson plant.

It is announced that the George H. Smith Steel Casting Company have purchased the entire plant and interests of the Milwaukee Steel Casting Company of Milwaukee, Wis. Business will be continued at the same location by the new firm. The business, as formerly, will be under the active management of George H. Smith. A 100-foot addition has just been built to the foundry, which almost doubles the capacity of the works. The Milwaukee Steel Casting Company were well known in the West for a number of years. The rapid expansion of business made a reorganization necessary, and while the new company will operate in a wider field, the same line of manufacture will be continued as heretofore produced.

PERSONAL.

E. B. Willard has resigned the general managership of the Hanging Rock Iron Company of Ironton, Ohio.

Edwin S. Cramp has been elected vice-president of the William Cramp & Sons Ship & Engine Building Company of Philadelphia, to succeed his brother, the late Henry W. Cramp.

Nevin McConnell, formerly superintendent of the open hearth plant of the Sharon Steel Company at Sharon, Pa., has resigned his position, taking effect on November 1.

Major L. T. Harper has resigned the superintendency of the plants of the American Steel Hoop Company in the Pittsburgh district. For 30 years he was connected with the firm of J. Painter & Sons in Pittsburgh. Major Harper will entirely relinquish active business.

William G. Backus has resigned as chief engineer of the Bessemer plant of the Republic Iron & Steel Company, at Youngstown, Ohio.

James Gayley, vice-president of the United States Steel Corporation, with D. M. Clemson and D. G. Kerr, officials of the Carnegie Steel Company, are on a tour of inspection of the ore properties of the United States Steel Corporation.

Andrew Carnegie arrived in New York on Saturday by the American liner "St. Louis."

Messrs. Axel Sahlin, J. Stephen Jeans and H. E. Parkes, representatives of the British Iron Trade Association, who inspected the large iron and steel plants in this country, have returned to England.

Charles T. Schoen, one of the founders of the Pressed Steel Car Company of Pittsburgh, and E. A. Schoen, his son, sold their stock in the concern some time ago, and both have recently retired. Charles T. Schoen was a member of the board and E. A. Schoen was second vice-president and manager of plants at Pittsburgh. It is said that Charles T. Schoen and E. A. Schoen will in the future give their entire time to the organization and operation of the Rolled Steel Car Wheel Company, who propose to build a large plant in Pittsburgh for the manufacture of car wheels. F. N. Hoffstott, president of the Pressed Steel Car Company, will assume the duties formerly filled by Charles T. Schoen.

The officials of the Canadian Pacific Railway have at present under consideration an immense scheme for the irrigation of the northwest of Canada, by which it is proposed to make good farming and grazing country out of the millions of acres which are dry and arid between Calgary and Medicine Hat, on the North Railway line. James Anderson, one of the leading irrigation engineers of the world, has recently traversed this area, and reports that there is nothing to prevent this work being successfully carried out. His report is being considered by the Canadian Pacific authorities, and it is understood that, as an experiment, 300,000 of the 3,000,000 barren acres will be put under irrigation.

S. W. Hanauer, United States Deputy Consul-General at Frankfort on the Main, reports that Germany's importations of iron ore during the first six months of this year were 2,048,020 metric tons, valued at 37,500,000 marks, about $8,750,000." Spain furnished 54.6 per cent.; next came Sweden with 25.8 per cent.; Austria-Hungary supplied 6 per cent.; Belgium, 4.9 per cent.; Algiers, 2.9 per cent. Now that ocean freights are low, Mr. Hanauer suggests that we ought to be able to supply Germany with iron ore.

The Pressed Steel Car Company of Pittsburgh have recently entered some large orders for cars. Among these was an order for 3000 cars for the Northern Pacific Railroad; 2000 of these will be combination box and steel cars and the other 1000 will be all steel coal cars. These 3000 cars will require about 36,000 tons of plates and shapes, nearly all of which will be furnished by the Carnegie Steel Company of Pittsburgh.

HARDWARE.

JOBBING CONSOLIDATION.

That the project for consolidating the interests of Hardware jobbers has not been abandoned is indicated by the references to the matter in the daily press and the rumors which are current among the trade. The whole enterprise is, however, involved in mystery, and those who are understood to be identified with the movement refuse to talk above a confidential whisper, except in the vaguest generalties which give no information as to the lines on which the proposed consolidation is to be effected. Many of the statements bearing on the subject which have appeared in the press, even though credited to reputable merchants, whose names, by the way, are for the most part withheld, are so fantastic and betray so crass an ignorance of existing conditions that they cannot be taken as reflecting the views of merchants who are interested in the project. Those who are fond of fairy tales might enjoy perusing them. In another part of this paper we give extracts from the daily press in which the subject is touched upon more reasonably, and which may be assumed to represent the views of some who favor the project, and the views also of the greatly larger number who have no faith that it can be carried out.

While it is generally conceded that something in the way of consolidation, by which the interests of several houses might be united, may be feasible, the idea that all the jobbing interests of the country can be united in a huge consolidation is generally regarded as so impracticable that it is considered incredible to most well informed persons that it has ever been seriously entertained. Some minor advantages, together with disadvantages, would undoubtedly attend a consolidation of even moderate size, but it is not likely that this will be found feasible except possibly within very narrow limits. So far as consolidation on the great scale which has been suggested is concerned there are few who regard it as other than utterly visionary.

Apart from the fact that the difficulty of bringing the jobbing trade together is insurmountable, it is conceded that even if such a colossal consolidation were to attempt to control the jobbing of Hardware it would have to reckon on the opposition ot manufacturers who desire to keep an independent rather than to take a subservient position, and on the intense disfavor of the retail merchants, who would bitterly resent the attempt to limit the source from which they could obtain goods to a single corporation. If anything of the kind were undertaken it is safe that new jobbing houses would appear with startling promptness and find the heartiest kind of welcome from the trade.

There would be a similar obstacle from the manufacturing side. There is not the slightest ground for supposing that competition there could be repressed, and manufacturers who did not succeed in finding a satisfactory market with the jobbers would find some other outlet for their goods. American enterprise may be trusted to hold its own and to make its way against any combination or consolidation. The laws of trade are stronger and more persistent than articles of incorporation.

SECURING FOREIGN MARKETS.

Although, according to official statistics, our exports have of late been making a new record, it is to be noted that the exportation of manufacturing merchandise shows something of a falling off in value, as compared with that of a year ago. One of the influences which has checked the foreign sale of American products is the heavy demand here, accompanied, as it has been in some lines, by higher prices. This condition has operated in two ways, as English and Continental competitors have been enabled, especially with their declining markets, to undersell the American manufacturers, while at the same time the urgent requirements of the home market have interfered with promptness in shipment to the foreign markets. The effect of the great Steel strike in augmenting the force of both of these influences is obvious.

It is not improbable that American manufacturers are in a measure blameworthy for any actual or apparent falling off in the sale abroad of their products. There is a great temptation to attend to the home trade even to the neglect of a foreign trade beginning to assume large proportions, and thus preparing to justify in practical returns the labor and expense with which it has been brought to this point. The importance of steadily and consistently cultivating the foreign market while the merchants abroad are in a receptive humor cannot be too strongly impressed on manufacturers. While the bulk of their production is absorbed by domestic trade, it must not be forgotten that when the supply catches up with the demand here there will be a universal scramble for other markets. There is undoubtedly, on the part of foreign buyers, a disposition to cultivate this country as a source of supply, and our manufacturers are becoming more generally and favorably known to merchants all over the world, who previously looked to London, Paris, Berlin, Hamburg and other European centers for the supply of their wants.

While these favorable conditions continue there should therefore be an earnest and unremitting attention to the requirements of foreign customers, even to the temporary inconvenience of those at home, and at the same time a vigorous extension of foreign relations, which are sure to be of great value when the domestic demand relaxes. The wise manager will look beyond the present convenience and profit and establish his connections in advance. The opportunity is so full of promise that it should not be neglected.

Condition of Trade.

The record made by the last month was, on the whole, very satisfactory. Not only was the volume of business good, but prices were, on the whole, quite well maintained. Weakness in a few lines which, owing to special reasons, developed lower prices is not to be taken as indicating the condition of the market as a whole, which is feeling constantly the effect of the large volume of trade and the strength in the price of the raw material. The condition of the iron market is such as to exert a steady influence on the values of the manufactured products. The matter of labor must not be overlooked as an element in the cost of goods. While there is no general advance in wages, in nearly all factories there has been a tendency in this direction, as individual advances have been made which, though not important in themselves, make in the aggregate a perceptible addition to the cost in producing the goods. The scarcity in several lines contributes to the general strength of the market and causes more or less inconvenience to the trade. The export business continues to be without important change or feature. Influences both for and against foreign trade are observed in a

survey of the field. In general, the lower prices in English and Continental markets operate against American business, and some lines, especially in heavy goods, feel this effect in diminished orders. In the Australian colonies business is in a very healthful condition. The removal of restrictions in the way of tariffs between the different colonies tends to increase intercolonial business. Their imports are also larger than ever before, and this country is probably reaping its full share of this increased trade. In South Africa, in spite of the unsettled conditions and the remote prospect of an early pacification, there is an increasing demand for goods outside of food products and munitions of war. The disfavor with which English goods and traders are likely to be regarded for an indefinite time by an important element of the population is making an opening of which the Germans are taking advantage, and of which American manufacturers might be equally prompt to avail themselves. In South American markets there is fair and increasing business being carried on, and the outlook in these important fields is regarded as promising.

Chicago.

(By Telegraph.)

With almost every mail order for Hardware which reached Chicago last Tuesday there was an item asking for Stove Pipe. The cold weather of Monday did it. The same quickening influence applied to numerous other seasonable articles, and, on the whole, trade was stimulated quite a little. November business has started off in a most satisfactory way. This statement can be better appreciated when it is noted that the Chicago Hardware trade for October is said by one of the largest factors here to have been heavier than that of any preceding October in their experience. It was not the largest month of the year, for September usually exceeds the succeeding month in aggregate trade. It is noticeable that those goods which have been scarce for some time and for which demand should decrease about this time do not become more plentiful. This does not apply to Sheet products, the famine there gradually subsiding, but to standard articles like Saws, Hammers, &c. January shipments are the best that are now promised on some lines. Tools of all kinds continue active, though the building season is ending. Unusual interest is shown in the probable course of Hardware prices, the conflicting tendencies of Billets and Nails putting the trade more or less at sea. Heavy Hardware is selling in continued large quantities for current requirements.

St. Louis.

(By Telegraph.)

From week to week for some months it has been our pleasant duty to call attention in our report to the enlarging and advancing tendencies of the Hardware market in this section, and we can still voice the continuance of the same favorable conditions, with evidences of a still larger volume of trade in the days since our last report. The coming of the cold weather may have a tendency to check the market in some degree, but any material curtailment is not considered likely. In our last report we called attention to the indications of a lower range of prices in the Wire and Nail market, but a steady tendency is now evident, and it seems to be the feeling that prices will hold at about the present level. Considerable comment is heard, both among the large jobbers and the retail trade, concerning the subject of fairs in general, and street fairs in particular. It is the custom of most of the cities and large towns to have a street fair as an annual occurrence, and there seems to be a wide diversity of opinion as to the returns for the trouble and expenses attendant to these shows. We make our comments of this subject strictly from the standpoint of the Hardware trade, and we are disposed to believe that it acts as a check in this branch and therefore is not considered of advantage.

Baltimore.

CARLIN & FULTON.—Business throughout October has been good, especially in some particular lines, and the trade generally has noticed an inability on the part of factories to sometimes make shipments as promptly as might be desired. It has been many a day since the trade has experienced a scarcity of Cut Nails, which has been the case for several weeks, not so much on account of any extraordinary demand for them, as on account of the inability of the manufacturers to obtain Steel.

In the line of Ammunition the manufacturers have been very much criticised by the trade for multiplying their customers to such an extent that shipments cannot be made to the satisfaction of any. The same number of goods will be marketed, whether supplied to 1000 or 10,000 houses, but this year the demand has been such that there is a universal complaint in regard to disappointments by the factories in the execution of orders.

We remember having read the statistics as to the average number of tons of lead necessary to kill one man in battle, and we think the proportion must hold good as to birds, judging from the millions of Loaded Shells shipped throughout the country.

The low prices at which Single Guns have been sold, it is stated, is one reason for the enormous demand, and the supply has been entirely inadequate, though sufficient, as we have just read, to cause one farmer in a neighboring State to lose his entire herd of Jerseys through mistaken identity for deer; while in a New England State we read a short time ago that since the season opened more men have been shot by mistake for deer than frequently results from a battle in South Africa.

Generally business would be stimulated somewhat by a little colder weather, for, while October has been a most pleasant and beautiful month, yet the temperature has been almost too warm for much activity in winter goods. November is never a very heavy month, being considered rather between seasons.

The new prices for Scythes, Hoes and Forks will give the retail trade an opportunity during the coming season to replenish to their own satisfaction stocks which have been starved for several years, and the possibilities are that the demand will be something abnormal, and no doubt in excess of the supply.

As far as we can judge the conditions for future business are good, though we regret that in certain sections the cotton crop has turned out far below expectations.

Louisville.

W. B. BELKNAP & CO.—The market maintains a wonderful steadiness, showing a large consumption of goods and a willingness on the part of purchasers to buy for all ordinary wants. The sale of household articles which contribute to the comfort of the individual and of the family go to show that the breadwinner is getting in his work every day.

There are some forecasters to whom the shortness of the corn crop seems to be a bugbear, but in this part of the country it is not such a factor as further West.

The earnings of our railroads continue flattering, and there is still a good deal of complaint about short supply of rolling stock. One of the prominent railroad men here assured the writer a few days ago that if their equipment were increased 25 per cent. they could find ready and profitable employment for it all.

There is a good deal of heavy construction in process, in the way of building in the cities, laying of sewers and subways, reconstruction of bridges, double tracking of railroads, or lengthening of switches, so that the prospect for general activity for some time to come is, as we say, exceptionally good.

The extreme dry weather has prevented tobacco in our local market from moving forward, also it is beginning to look a little bad for the wheat which is in the ground. But this same dry weather is said to be bringing out a top crop of cotton, which will supplement Southern agricultural earnings to no small extent.

A good deal of interest just now is centering on the political situation in New York and elsewhere. Before

another issue of *The Iron Age* we shall have duly explained why and how it happened.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Since our last letter trade has continued quite active, the volume of business being in excess of one year ago. Retail merchants report to us that the demand from consumers is active.

The pleasant weather that we have had during the last six weeks has enabled the construction of buildings to go forward favorably without interruption from unpleasant weather, consequently the demand for Builders' Hardware is fairly active. Season goods of all kinds are moving favorably forward, and holiday goods are now receiving some attention. Owing to the destruction of the steel goods combination there is a weakness in that entire line of goods, including Forks, Hoes and Scythes.

Manufacturers are still behind their orders on very many kinds of goods, which is embarrassing to the wholesale trade, and causes dissatisfaction to the retailers in many cases. It is, therefore, more than usually important that the jobbers keep up their stock to the fullest extent possible, which, we think, it is safe to say is being done to a greater extent than heretofore. Speaking for ourselves, our stock on hand is larger than it has ever been before at this time of the year.

Collections are fair.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Never in its history has the Pacific Northwest had finer weather to garner and harvest its crops than this fall. At the same time there has been enough rain to put the ground in good condition for plowing and seeding. There is a profusion of roses, and flowers are blooming, although November is at hand, and strawberries grown here are in the market.

Lately we have put afloat the largest cargo of lumber ever shipped—4,000,000 feet, its destination being China and Siberia. The export of lumber from this port is growing by leaps and bounds. We made a new record in the wheat export for October, and the 24 ships now in port, with more to blow in, will put November far ahead of October. When returns are at hand for lumber, wheat, barley, hops and prunes we expect to make a satisfactory showing.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—We find the Hardwaremen in this section are in good spirits over the trade they are now having, and have had, and feel quite hopeful for the future. The weather in this section for the month of October has been exceptionally fine, and all improvements in outdoor work have progressed splendidly. This to some extent has stimulated the sale of Builders' Hardware, Hinges, Nails and kindred lines of goods. We do not think that trade was ever better in this section of the country at this time of the year, but some lines of goods which usually move pretty freely at this season of the year have been going slow on account of warm weather. In this list we would mention Stoves, Stove Boards, Pipe, Guns, Canvas Goods and Lap Robes.

Collections are quite as satisfactory as trade, and if the manufacturers do not allow prices to become demoralized we see no reason why this state of affairs should not be continued for quite a while.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—October business has been fairly satisfactory. It was not quite so large as in September, for various reasons, but there was a steady demand for the goods usually required at this season. In some lines, such as Stoves, Axes, &c., assortments have been some broken, and it has been simply impossible to replenish stocks from the factories. The result is disappointment to the wholesale and retail dealer, and considerable loss is entailed on both of them, and certainly the manufacturer cannot feel well over it. A still more influential cause for the little dullness in trade that has existed is that the weather has been favorable for the saving of the crops and for other fall work during the last half of October, and the farmers have been too busy otherwise to use as much Hardware as usual. However, the most important work for all concerned that can engage the farmer is to save the present crop and to plow for the coming year, and we are content to see a little dullness now from this cause. Three weeks more of such weather would place the farm conditions in as favorable shape as we often find them. At this writing there is a heavy fall of rain, with the prospect of a cold wave. It is hoped that winter is not yet setting in, as winter now would mean a large loss from the crops that are not threshed. With favorable weather for the next three weeks trade conditions would be very satisfactory. Collections have shared to some extent with trade in the slowness of the month.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The jobbing Hardware trade of this section continues to show gratifying activity in all lines, and we have to report a still further increase in the general demand. The shortage in the corn crop alluded to in former reports appears to be of a sectional character, more or less, and has no appreciable effect on the general trend of business.

No marked changes have occurred, the general situation remaining in much the same condition as noted in previous reports.

Enterprises under way and projected are being pushed forward with steady and persistent perseverance. In this regard the condition of this entire Western country at this time is one of healthfulness, progression and prosperity.

NOTES ON PRICES.

Wire Nails.—While the volume of Wire Nails required to supply the demands of the trade is large, buyers are conservative in the size of orders placed. It is evident that competition is having a weakening effect upon the market, and concessions are being made of from 10 to 15 cents per keg in some cases, while a good deal of business is being done at regular quotations. The market is thus represented in a general way by the quotations of $2.15 to $2.30 in carload lots, f.o.b. mill. Differentials between jobbers' and retailers' prices are not usually maintained in the prices made by jobbers to the smaller merchants, and the manufacturers who have recently entered the field are not observing any uniform rule in regard to prices to the larger and the smaller trade.

New York.—Wire Nails in the local market continue in about previous demand. The smaller merchants are being benefited by the concessions in prices made to jobbers by manufacturers. The market is rather weak for small lots at store at $2.45 to $2.50. Carloads on dock are sold at $2.35 to $2.40.

Chicago, by Telegraph.—Wire Nails are not selling in the volume of a month ago, for the building season waxes old. Orders, too, are mainly for small quantities. But the aggregate is more than respectable—it is impressive. There is said to be no present accumulation and with the late season and the usual tonnage required this winter for repair work the prospects for large production are excellent. From a mill standpoint the tone of the market is slightly firmer, but from a store point of view the opposite condition prevails. Jobbers are generally quoting carloads at $2.40 and small lots at $2.45, but an occasional quotation of $2.40 for small lots is heard.

St. Louis, by Telegraph.—While the shading of prices was to be noted in the market for Wire Nails when last reported, a steadying tendency now prevails and prices are likely to remain at present level. Carload lots to retailers at $2.50, and less than carload lots at $2.55 to $2.65.

Pittsburgh.—There is a seasonable demand for Wire Nails, but the market as regards prices is somewhat unsettled and concessions of 10 to 15 cents a keg on orders of carloads and larger lots are made. The demand for Wire Nails at the present time is not sufficient to take

the output of the mills, and with the entrance into the market of new competition prices are somewhat lower. We quote Wire Nails at $2.15 to $2.20 in carload lots, and $2.20 to $2.30 in less than carloads. In some sections of the country we are advised that slightly higher prices than the above are being obtained.

Cut Nails.—The Cut Nail Manufacturers' Association, at a meeting held last week, reaffirmed former prices for the month of November. Difficulty still exists in obtaining Nails promptly, owing to the trouble of manufacturers in obtaining Steel. Quotations are as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....$2.05
Less than carload lots.....$2.10 to 2.15

New York.—The condition of the local Cut Nail market remains unchanged Steel Cut Nails are still scarce, owing to delayed shipments, resulting in broken assortments in jobbers' hands. New York quotations for carload and less than carload lots are as follows:

Carload lots on dock.....$2.18
Less than carload lots on dock..... 2.23
From store.....$2.18 to 2.30

Chicago, by Telegraph.—Prices of Wire Nails have so receded that attention is temporarily withdrawn from Cut Nails, the quotations of which remain unchanged at $2.35 in small lots.

St. Louis, by Telegraph.—A generally satisfactory condition of demand and inquiry continues in the Cut Nail market and prices remain the same. Small lots from store are quoted from $2.30 to $2.35.

Pittsburgh.—The Cut Nail manufacturers held a meeting last week and reaffirmed October prices for November shipment. There is a fairly large demand for Cut Nails, but there is less difficulty in getting a full assortment of sizes from the mills, owing to the fact that supply of Steel is better. We quote for domestic trade, f.o.b. Pittsburgh, plus Tube freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....$2.05
Less than carload lots..... 2.10

Barb Wire.—Owing to the lateness of the season the demand for Barb Wire shows a perceptible falling off, although it is quite large in some sections. Because of competition prices are more or less shaded, according to the order and point of delivery. The market is, however, generally steady and prices well maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....$2.60
To jobbers in carload lots, Galvanized..... 2.90
To jobbers in less than carload lots, Painted..... 2.65
To jobbers in less than carload lots, Galvanized.... 2.95
To retailers in carload lots, Painted..... 2.70
To retailers in carload lots, Galvanized..... 3.00
To retailers in less than carload lots, Painted..... 2.80
To retailers in less than carload lots, Galvanized...3.10

Chicago, by Telegraph.—The Barb Wire trade has not ended, sales being reported quite active for the season. Prices are unchanged. Carload lots are quoted at $2.75 for Painted and $3.05 for Galvanized. Less than carloads are quoted $2.85 and $3.15, respectively, with these prices firmly held.

St. Louis, by Telegraph.—The condition of the Barb Wire market is considered satisfactory, with a good demand for this season. The feeling noted in our last report that prices in this department might work lower seems to be changed, and it is now heard that prices are likely to hold at present level. Jobbers quote carload lots of Painted at $2.85, and Galvanized at $3.15, less than carload lots at $2.90 for Painted and $3.25 for Galvanized.

Pittsburgh.—There is a fair amount of business being placed, but not so heavy as some time ago. Established prices on Barb Wire are being shaded more or less, depending on the order. For domestic trade we quote: Galvanized Barb Wire, $2.90 in carload lots to jobbers, and Painted, $2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—The requirements for Plain Wire continue large and generally satisfactory. Mills are busy and are not accumulating stocks of any size. At competitive points there is some irregularity in price. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots	$2.25	$2.65
To jobbers in less than carload lots	2.30	2.70
To retailers in carload lots	2.35	2.75
To retailers in less than carload lots	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	Base					$0.40	extra.
10	$0.05	advance	over	base		.40	"
11	.10	"	"	"		.40	"
12 and 12½	.15	"	"	"		.40	"
13	.25	"	"	"		.40	"
14	.35	"	"	"		.40	"
15	.45	"	"	"		.75	"
16	.55	"	"	"		.75	"
17	.70	"	"	"		1.00	"
18	.85	"	"	"		1.00	"

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago, by Telegraph.—Profiting by last season's delay, manufacturers of Wire Fencing and similar products are beginning to contract for early deliveries, specifying January not uncommonly. This trade is starting up unusually early and seems to bode a lively coming season. There is also a satisfactory current trade in a small way. Carload lots of Wire are held at $2.40 and small lots from stock at $2.50.

Pittsburgh.—There is a good seasonable demand, heavier than usual at this time of the year. There is some shading in prices of Plain Wire for good orders and for certain points of shipment. We quote the general market and for domestic trade as follows:

To jobbers in carload lots.....$2.25
To jobbers in less than carload lots..... 2.30
To retailers in carload lots..... 2.35
To retailers in less than carload lots..... 2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Asbestos Air Cell Coverings.—F. J. Gast, 26 Cortlandt street, New York, manufacturer of Asbestos Air Cell Coverings for hot air furnace pipe, furnaces, steam pipe, boilers, &c., quotes the following discounts from the list given below on the three classes of these Coverings which he is manufacturing:

	Discount.
Class A, 1 inch thick, for high pressure	50 %
Class B, ¾ inch thick, for low pressure	60 %
Class C, ½ inch thick, for hot water	65 %

Inside diameter of Pipe.	Per lin. ft., canvas jacketed.	Elbows 90°—45°.	Tees. Valves.	Crosses.
½ inch	15c.	16c.	24c.	28c.
¾ inch	16c.	20c.	26c.	34c.
1 inch	18c.	20c.	26c.	34c.
1¼ inch	20c.	20c.	26c.	34c.
1½ inch	22c.	20c.	26c.	34c.
2 inch	24c.	22c.	29c.	38c.
2½ inch	27c.	25c.	33c.	42c.
3 inch	30c.	29c.	38c.	48c.
3½ inch	34c.	32c.	42c.	54c.
4 inch	38c.	35c.	47c.	60c.
4½ inch	42c.	40c.	52c.	64c.
5 inch	46c.	46c.	60c.	72c.
6 inch	50c.	52c.	72c.	80c.
7 inch	55c.	66c.	96c.	88c.
8 inch	60c.	80c.	108c.	96c.
9 inch	65c.	88c.	120c.	108c.
10 inch	75c.	100c.	140c.	120c.
12 inch	90c.	140c.	175c.	150c.

Gast's Asbestos Air Cell Boiler Blocks and Boards are sold from the following list, which is subject to a discount of 50 per cent.:

	Per square foot.
½ inch thick	12c.
1 inch thick	24c.
1½ inch thick	36c.
2 inch thick	48c.

His Asbestos Standard Cement is sold at $4 per bag, and his Special at $3 per bag, both subject to a discount of

50 per cent. Pipe Covering in the form of rolls ¼ inch thick, 36 inches wide, and containing 250 square feet, for furnacemen and others, is sold at $10 per roll, subject to a discount of 50 per cent.

Cordage.—The Rope market has not shown any marked changes during the week. Business is moderate, owing to high values. Manila Rope, on a basis of 7-16 inch and larger, varies in price with manufacturer from 12¾ to 13 cents, and Sisal, on the same basis, from 8½ to 9¼ cents per pound, with ¼ cent rebate for larger lots. Jute Rope is receiving considerable attention under the foregoing conditions. Jute Thread Rope, ¼-inch and up, is quoted at 6½ cents for No. 1 and 6 cents for No. 2. Jute Yarn Rope, ¼-inch and up, is quoted at 5 cents per pound.

Glass.—Representatives of the Window Glass combines and the Executive Commtitee of the National Window Glass Jobbers' Association recently held a meeting, at which time the manufacturers agreed to sell members of the association small Glass (the first three brackets) at considerable reduction from former prices. This action was foreshadowed by the arrangement, which we announced last week, by which the members of the Jobbers' Association were permitted to use their discretion in making prices low enough to meet foreign competition. It is evident that combine manufacturers and the Jobbers' Association are determined to reduce imports to the lowest possible quantity. It is understood that another meeting will be held some time this month at which the jobbers will place a bulk order for Glass with the manufacturers. Local quotations are as follows: Less than car lots from store, 80 and 20 per cent. discount; carloads from factory, 85 and 5 per cent. discount.

Paints and Colors.—*Leads.*—The market for White Lead in Oil is reported to be in somewhat of a demoralized condition, owing to cutting of prices in the West, which has since spread to the East. Concessions from regular quotations of from ¼ to ½ cent per pound on some brands are said to be obtainable. We quote as representing the market in a general way as follows: In lots of 500 pounds or over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—*Linseed Oil.*—During the week out of town Raw Oil sold down to 60 cents in 5-barrel lots. Quite a general price of City Raw with concerns who have Oil is now 60 cents in 5-barrel lots, and 61 cents in lots less than five barrels. Others who have little Oil to dispose of continue to quote 65 to 66 cents, according to quantity. Out of town Raw Oil is quoted at 58 cents in carload lots, and 59 cents in 5-barrel lots. Demand is quite active for small lots. On a declining market it is not expected that more than enough Oil to supply urgent requirements will be ordered.

Spirits Turpentine.—The market for Turpentine has gained no strength during the week. Demand in the local market has been restricted to small jobbing lots. Light demand and somewhat easier feeling in Southern market caused a falling off of ½ cent per gallon. Local quotations, according to quantity, are as follows: Southerns, 38 to 38½ cents; machine made barrels, 38½ to 39 cents per gallon.

AMERICAN EXHIBITION, CRYSTAL PALACE, LONDON.

PREPARATORY work is now being done for an American Exhibition, to be held in the Crystal Palace, London, England, May to September, 1902. It will be distinctively American, and is designed to demonstrate the immense commercial development which has taken place in the United States during recent years in American products, arts, industries and inventions. The time chosen will enable intending exhibitors to get their products before probably the greatest assemblage of visitors from the English colonies from all over the world ever gathered in London, the magnet being King Edward's coronation ceremonies, which will occur in June next. The Advisory Committee contains the names of many well-known men, both English and American, including the Lord Mayor of London. The Commissioner for the United States is Alfred H. Post of the Anglo-Saxon Shipping Company, Produce Exchange Building, New York, from whom plans and particulars concerning space can be obtained. The Crystal Palace contains 150,000 square feet of space for exhibits, there being 200 acres of ground in all, of which the building covers 16 acres.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Paints in the Hardware Store.

The following letter from a well-known house manufacturing Paints and Varnishes is of interest as indicating the extent to which this line of goods is being handled by Hardware merchants. It will doubtless suggest to some of our readers the desirability of considering the question as to the propriety of adding a department for the sale of Paints, Oils, &c., to their business:

A very large percentage of the Hardware dealers handle Paints, White Lead, Varnishes, Oil, Colors, &c. Aside from the profit that thehe is to them in this line, this is largely due to the fact that the Hardware dealers furnish Nails, Hardware, &c., for building purposes, and naturally have a demand for Paint on this account.

In some localities the drug stores carry Paint, but this is gradually changing from the drug stores to the Hardware stores, as it is more properly in line with the business of the latter.

Hardware jobbers also find it to their interest to add some of the Paint line to their list, more particularly White Lead, as same can be sold without any trouble in connection with their own line.

We have a number of Hardware jobbers whom we supply with White Lead, Wagon Paints, Carriage Paints and also receive orders from them for Mixed Paints and some other goods in our line. Nearly all of them carry a stock of White Lead, and some of them carry a stock of Paints.

There is no question but that eventually every up to date Hardware dealer will carry a stock of Paints, White Lead and Varnishes.

COLUMBIAN HARDWARE COMPANY'S NEW CATALOGUE.

THE COLUMBIAN HARDWARE COMPANY, Cleveland, Ohio, successors to Van Wagoner & Williams Hardware Company, have just issued an illustrated catalogue of Spring Hinges, Door Springs and Coat and Hat Hooks, which includes the well-known Gem, American, Oxford, Acme and Columbian brands of Spring Hinges, together with Strikes, Latches, &c., for lavatory doors, Cabinet and Showcase Spring Hinges and goods of similar character. The company also make a full line of Blacksmiths' and Horseshoers' Solid Box Vises and Machinists' and Coach Makers' Bench Vises, which will be treated in a separate catalogue, which will be issued at an early date.

BAY STATE TAP & DIE COMPANY, Taunton, Mass., announce the purchase of the business of Hall & Williams, Mansfield, Mass., makers of Taps and Dies.

THE next meeting of the New England Hardware Dealers' Association will be held as usual at the United States Hotel, Boston, November 13, and a large attendance is expected. The Entertainment Committee has provided an attractive programme, including an address by Hon. Samuel L. Powers, member of Congress from the Eleventh Massachusetts District, and singing by James W. Calderwood.

Correspondence.

THE CONSOLIDATION OF JOBBING HOUSES.

NEW YORK, November 4, 1901.

To the Editor: In complying with your request for an expression of my views on the subject of a consolidation of Hardware jobbing interests, I may begin by stating that it is one to which I have given more or less consideration for a number of years past, and which I have frequently discussed with friends identified with the jobbing trade.

Whatever foundation, if any, there may be for the rumored attempt to form a consolidation of Hardware jobbing houses, I see nothing in the idea which is either improbable or impracticable. On the contrary, for at least three years past I have believed such a unification of these interests to be a logical outcome of the existing trade situation, and have predicted that it would inevitably be accomplished at some time in the not distant future. The reasoning on which this belief was based is the parallelism which exists between the producing and distributing industries. In each the tendency, for at least 50 years, has been to concentration into larger and larger units, with resulting increase of efficiency and economy. This process is now culminating, in the case of the staple productive industries, by the complete unification of many of them into large single organizations, each embracing all, or nearly all, of the total productive capacity of the country. The conditions in the distributing industry offer equal inducement to apply this process and to realize the higher economy, the larger profit and the better control which it affords. Therefore I have reasoned that before long we would see, in the field of distribution, a movement parallel to that which has already taken place in the fields of production and transportation, for the development and application of the theory of "community of interest."

In transportation and production it has long been recognized that unregulated competition is usually incompatible with reasonable profits, and in both of these directions great progress has been made in harmonizing interests which were formerly antagonistic, and in thus creating better conditions for all concerned. The same opportunity exists in distribution, and therefore I am not surprised at the rumored indications of a readiness among Hardware distributers to consider plans for a closer relationship and for the improvement of trade conditions. On the contrary, and as a manufacturer, I welcome these indications because I believe thoroughly in the tendency which they illustrate and the principle which they embody.

The difference between the cost of production and the price paid by the consumer represents the fund which is divisible between the producer and the distributer, and from which both of them must obtain their respective profits. Therefore, anything which tends to increase this fund, and to relieve it from the violent fluctuations to which it is liable under competitive conditions, tends to promote the interests of both the producer and the distributer. Heretofore far too large a portion of this fund has been dissipated by trade rivalries among producers or distributers, or both, often to an extent which has made one or another of the divisions of the business in which we are all interested unprofitable to all concerned. It is becoming more and more evident that the most effective, if not the only, remedy for these difficulties lies in the direction of co-operation. "Community of interest" is not merely a phrase but a fact; the more promptly and fully the fact is recognized in each important field, and business relations readjusted accordingly, the better, in my opinion, for all concerned.

Trade associations, in one form or another, have long existed among manufacturers; the absence, until recently, of similar organizations among distributers may, in some cases, have caused the former to undervalue or ignore the just rights of the latter. Whether so or not, I believe that the interests of both will be advanced when each deals with the other through the medium of strong and well managed trade associations. I regard the conditions thus implied as the logical culmination of the tendency to concentration which has been so marked a feature of recent years, and I believe that these conditions, when effectively established, will conduce surely and largely to the welfare both of the producer and the distributer.

Respectfully,

HENRY R. TOWNE.

WHAT THE NEWSPAPERS SAY ABOUT JOBBING CONSOLIDATION.

WE give the following extracts from the daily press, which may be of interest as illustrating the manner in which the proposed jobbing consolidation is touched upon. They represent, it will be seen, a diversity of opinion in regard to the feasibility of the project:

From Boston Herald:

The Hardware jobbers of this city are so much interested in the proposed $100,000,000 combination that they don't want to talk about it to the newspapers. A number of the men prominent in the trade, when seen yesterday by a *Herald* reporter, admitted that they had been approached on the subject, and they advocated the proposition to a man.

What bids fair to take place is this: All jobbers of Hardware will combine and have a common source of supply, probably with headquarters in New York. This will invite a combination of manufacturers, so some of the jobbers assert, because the manufacturers will as surely find it to their advantage to get together and meet under reasonable terms the economic demand exerted through the medium of the jobbers' combination, as the jobbers have occasion to find it economic to merge their interests.

Just what all this may amount to may be got from the fact that the Hardware trade ranks among the very first in the country in financial interests involved, and, so far as Boston is concerned, the half dozen and more wholesalers do business that runs high in the millions annually, covering New England by from 6 to 20 salesmen each. One jobber said that the tonnage of Hardware shipped in New England was greater than that of all other shipments combined.

In speaking for information purposes alone, but "by no means to be quoted under his name," one of the prominent jobbers said:

> In a general way it may be said that centralization, as obtains in all combinations, is the main object of this Hardware movement, the getting together under one roof, so to speak. This will obviously enable the supply department of the jobbing trade to work for all, and in this way not only will prices be regulated by coming in more direct contact with the manufacturer, but through obtaining information at closer hands with the consumer and thus obtaining more precisely the conditions of supply and demand. In other words, with a central office we may know all the time just where the trade stands, and the manufacturers will know it; and, incidentally, in my opinion, will make combination among them a practical necessity. They won't find it economic to deal severally with us any more than we find it entirely advantageous to deal severally with the retailer. Then, of course, there are the numberless savings of expenses through centralization; last but not least among the list of advantages, it will put a stop to this ceaseless competition.

At this the advocate of the jobbers' combine leaned back in his chair, and for the moment his face seemed to lighten with relief at the thought of a hunting ground where there wouldn't be half a dozen other commercial hounds forever after the same game.

> Take it in Boston, for instance, he continued, we all get against one another all the time, to the end that the competition really unsettles things to the actual disadvantage of the retailer and consumer, ideas to the contrary notwithstanding that competition is the only thing that keeps the price

down. The manufacturer and the jobbers, by respectively combining, can make more money, and at that sell goods much cheaper through combination, on account of the reduced expenses, than under the best present conditions.

One jobber said that he knew of a man in New Orleans who had got so worked up about it that he had written manufacturers all over the country to know what they were going to do before he took any decisive action.

Another man had a telegram on his desk, which he confidentially showed the reporter, from a friend of his, a jobber down South somewhere, asking advice. "And my advice was," the Boston jobber said, "to get in under cover."

The present condition of the stock market is said not to be particularly inviting to the launching of such affairs, but one of the jobbers winked his eye, said that there was a good time coming soon, very soon, and that, give this project an opportunity, and it would be a great thing for all concerned.

From Minneapolis Times:

There seems little chance that the scheme to organize the Hardware jobbing interests of the country into a trust or pool will be successfully carried out.

The plan in detail was this: A company with a capital of $100,000,000 would be organized to control and manage the business of the large Hardware jobbing houses. The jobbers would be paid for their stocks of goods and good will with shares of stock of the new concern. It was urged that such a move would enable the new company to get better terms from the manufacturers; much expense would eventually be saved by combining several houses in each city or section; and competition would be shut off and prices would consequently advance.

Work on the deal has been going on systematically for several months, but the promoters are meeting with poor success. Some of the Minneapolis Hardware jobbing houses have been approached on the subject, but the responses have been discouraging to the promoters. No Minneapolis firm has yet agreed to enter the combination, and there is not much likelihood that any will do so.

A member of one of the leading jobbing houses of the city last night said:

> There is practically no chance for the scheme being carried out. It does not appeal to business men. If the trust or pool should be organized and half or two-thirds the jobbers of the country should go into it very little would be accomplished. We do not manufacture any articles, and any man with capital can buy from the factories and start up an independent business with as good chance of success as the trust man near him.
>
> We have been requested to go into the deal, but we have not done so, and there is little possibility of our doing so. Neither have any other jobbers of Minneapolis signed contracts which have been sent to them to sign. I think few, if any, of our men will consider the move favorably.
>
> The promoters have been working on it for some time, but do not appear to be any nearer a successful termination of their efforts now than they were months ago.

From The Minneapolis Journal:

A plan to combine the Hardware jobbing interests of the country is on foot. Minneapolis firms have been approached for the purpose of getting them into the organization. It is believed that if a few of the leading houses in the United States can be brought into the combination the success of the deal is secured.

The scheme originated with a jobber in Pittsburgh, assisted principally by Boston men, who have interested some of the largest Hardware wholesalers as well as backers of financial standing. The law firm of Reed, Thatcher, Simpson & Barnum, New York City, of which Thomas Reed is senior member, is counsel for the interested parties, and to this firm options are to be forwarded.

The plan more in detail is this: To organize a company with a capital of $100,000,000, having headquarters in New York; the company to control and manage the business of the majority of the large Hardware jobbing houses. The jobbers, under certain terms, are paid for their stocks at fixed values, with a bonus for good will.

A promoter has been visiting the big wholesale Hardware firms in the country seeking options, and in the course of his business came to Minneapolis. It is understood that he met with little encouragement here.

Three principal advantages are given as making the plan of centralization of interest feasible:

1. The buying capacity of a central office and the influence over manufacturers.

2. The great saving of expense by eventually merging several houses in each city or section.

3. The stopping of fierce competition and the consequent advance in prices.

Opponents of the combination say that the $100,000,000 will buy only $40,000,000 worth of business and the rest will be water. It is added that if the deal goes through the manufacturers will establish sales depots through the country, for at present the output from the factories is greater than the demand, and those who do not sell to the combine will have to go out of business. Another circumstance that militates against success is said to be the fact that there are too many regular wholesale houses in this country to be gotten hold of, and those which handle Hardware as a side line are countless.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

Watt-Harley-Holmes Company, Fitzgerald, Ga., have opened a branch house in Douglas, Ga., and request the trade to send them catalogues relating to Hardware, Stoves, Paints and Sporting Goods, Tinware and Crockery.

The Wilkins-Leonard Hardware Company, Youngstown, Ohio, have been incorporated with a capital of $50,000, and the following officers: President, William R. Leonard; vice-president, C. B. Folsom; secretary, E. R. Thomson; treasurer, George Tod, Jr.; general manager, C. F. Wilkins. The company expect to have their large new Hardware store in readiness for business on December 15. They will carry on a wholesale and retail business, and request catalogues, price-lists, &c., from manufacturers.

The Hardware store of Fischer Bros., Newport, Ky., was gutted by fire on the 16th ult., greatly damaging the stock, the goods being sold at a sacrifice. All their catalogues, discount sheets, &c., were destroyed. The firm will therefore be glad to receive copies of catalogues and other printed matter relating to general Hardware, as well as quotations on the same.

MASSACHUSETTS TOOL COMPANY.

MASSACHUSETTS TOOL COMPANY, Greenfield, Mass., under date 24th ult., announce that they have purchased the entire mechanical tool business of Coffin & Leighton, Syracuse, N. Y., including machinery, stock, fixtures, patents and good will. They will shortly install the same in their factory at Greenfield and be in a position to supply the wants of their friends. They request that all orders for articles formerly made by Coffin & Leighton be sent to them to avoid delay. In the near future the company intend issuing a complete catalogue showing Tempered Steel Rules, Protractors, Surface Gauges, Micrometers and various other instruments of precision of a similar character.

STANDARD PAINT COMPANY'S PAN-AMERICAN EXHIBIT.

The products of the Standard Paint Company, 100 William street, New York, were displayed in their own special building, named the P & B Building, which was located near the Canadian Building. This structure was used by the company at the Paris Exposition, and brought from there to Buffalo. It was designed primarily to show the practicability of using Ruberoid roofing for siding, ceiling and floors, being constructed entirely of this roofing, inside and outside. This material, while water proof, can be easily painted in any color, thus being capable of a great variety of decoration, as shown by the attractive scheme of coloring adopted for this building. The exhibit in the building comprised specimens of the P & B Paints, Electrical Compound, Armature Varnish and Building and Insulating Paper. An interesting collection of medals received from expositions all over the world was shown.

Standard Paint Company's Pan-American Exhibit.

WISCONSIN RETAIL HARDWARE ASSOCIATION.

THE next annual meeting of the Wisconsin Retail Hardware Association will be held in Milwaukee on the first Wednesday and Thursday of February, 1902. C. A. Peck, Berlin, the efficient secretary of the association, advises us that the association is actively prosecuting its work for the betterment of trade conditions. With very few exceptions the members are paying up their dues, and a keen interest in the association work is manifested. The organization is stronger than ever before, and the next meeting will, it is hoped, show a substantial growth during the past year.

The Buffalo *Enquirer* of the 29th ult. contains an illustration of the handsome four-story Iron and Steel warehouse which Weed & Co. of that city have opened at 145 and 147 Swan street. The warehouse is a capacious one and has a floor area of 40,000 square feet.

PRICE-LISTS, CIRCULARS, &c.

R. E. DIETZ COMPANY, Greenwich and Laight streets, New York: Catalogue showing their line of Dietz Tubular Lanterns, Street Lamps, Driving Lamps, Automobile Lamps, Bicycle Lamps, Locomotive Head Lights, Commercial, Railroad, and other Lanterns.

REMINGTON AUTOMOBILE & MOTOR COMPANY, Utica, N. Y.: Catalogue of the Remington Standard Automobiles, Launches, Motors, Caburetters, Mufflers, &c.

BEALL SHOVEL COMPANY and BEALL BROS., Alton, Ill.: Circular giving an illustration of their combined Shovel and Mining Tool plants, which occupy one and a half blocks.

MILLER LOCK COMPANY, Philadelphia: Catalogue No. 16, illustrating their line of Locks, Padlocks, &c. A new Padlock shown is the Protector, Jr., which is made in five sizes.

H. W. JOHNS MFG. COMPANY, 100 William street, New York: Pamphlet describing their Asbestos Fire Felt Coverings for steam pipes, boilers, &c.

BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridge, Mass.: Catalogue of Marine Rubber Goods, comprising Fire Hose, Suction Hose, Steam Hose, Wash Deck and Ash Sprinkling Hose, Hose Pipes, Couplings and Strainers, Packings, Gaskets, &c.

WILCOX MFG. COMPANY, Aurora, Ill.: Large poster calling attention to their Velox Grindstone.

JOHN CHATILLON & SONS, 85-89 Cliff street, New York: Illustrated circular of Spring Scales for use by wholesale provision dealers, made with both round and square pans, on the inner side of which is a *fac-simile* 10-inch dial for the 150-pound scale, the pointer of which makes three revolutions, the dial itself registering 50 pounds by ½ pounds.

E. A. HENRY has disposed of his interests in the Cuyahoga Steel & Wire Company, Cuyahoga Falls, Ohio, and resigned as president.

SHOW WINDOW DISPLAY.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HARDWARE STORE WINDOW DISPLAY.

BY B. W. HAVERFIELD.

Window display and local advertising should go hand in hand. If a display is made of any particular goods, the local advertising should refer to the goods being shown and attention called to the display in the windows. Ofttimes a person will be led to visit a store from reading an advertisement if he knows he will see an attractive exhibition of the goods. In the advertisements a detailed description of the goods may be given, and the displays in the windows should correspond in every way with the description. If a display is especially attractive attention may be called to the fact in the advertisements, and the one be made to assist the other to benefit the merchant.

Windows are the best mediums at the command of a merchant. One good display in the window is better, even if it should stand for a month, than a display advertisement for the same length of time in the average weekly paper.

THE COMMON MISTAKE.

The most common mistake of Hardware dealers in arranging windows is that they do not arrange them at all. The goods to be shown should not merely be set in the window haphazard. It should always be the aim of the artist to show an idea of design and tasteful arrangement which is indicative of the methods of the interior. That is, a tastefully arranged window from the outside will draw trade into the store which otherwise would not be attracted by slovenly arrangement of the windows. It is possible in nearly all lines to have some one prominent piece for a center piece, and all the space should be utilized—walls, floor and rear—but not in a crowded manner. Small stocks can generally be placed upon shelves and brackets, which may be draped or covered in goods, &c.

POSITIVE ADVANTAGES.

In nearly all cases, and with nearly all stocks in a Hardware store, a greater increase of sales can be traced to window exhibits than to any other cause. Attractive displays of any class of goods is half the battle of selling them, and a proof of this is found by an experimental Cutlery window. Make an attractive window of Cutlery and price one article—any particular Knife—and watch the sales for a week. The window will attract the eye of the passers and the one price will do the selling, which is good evidence of the efficacy of neat windows.

There are many advantages in attractive show windows. A neat display in any line is proof positive to the average buyer and pedestrian that on the inside are also to be found other beautiful displays and attractive goods.

FIXTURES, ETC.

Any window artist with half an eye for unique and attractive arrangement will recognize the desirability of fixtures, shelving, &c., and if he can boast ever so little originality he will design them to his liking as the necessity and class of goods to be shown demands.

Mechanical appliances in show windows, while adding very greatly to the attractiveness of some displays, are matters depending entirely on the time, the originality of the artist, the size and capacity of the windows, the amount of capital for expenditure at his command and the class of goods to be shown.

LIGHTING THE WINDOW.

The subject of lighting a show window is one of very great importance. Where electricity may be used the problem is an easy one. But it is very difficult to light properly with gas or kerosene. Electric incandescent lights can be placed in many ways and places without danger of combustion, but the other lights have to be so arranged as to provide for safety. However, the one great principle to be observed is that all lights should reflect upon the interior of a window only and not in the eyes of a pedestrian. They should show down from the top of a window, and be placed on the inside front next to the glass or ceiling. Reflectors when used should be round ones, throwing equal rays in all directions, &c. Lights in other positions depend on the circumstances of effects desired and stocks shown.

PRICING GOODS.

Prices on goods in windows depend upon what the competitor is doing. If your competition is inclined to cut prices, your prices if shown tell what you are doing and what you intend to do. Where circumstances will permit it is desirable to name prices, as it saves time and trouble to the buyer and is generally more effective in selling; for a customer will invariably figure out in his own mind when inspecting an article whether it is cheap or otherwise, and if the price seems a fair one he will be tempted to go inside for a further inspection of the goods. However, it is a question depending on the local business conditions. If a price is not a fair one it is best not to name it. The sale in such cases should be left to the efficiency of a good salesman. A prospective buyer will generally remember a price and forget the style or quality on coming inside and asking to see most articles, and for that reason it is very desirable to name prices in show windows when conditions will permit.

BACKGROUNDS.

Backgrounds for windows, walls, sides, &c., depend entirely upon the stocks to be shown and the circumstances of light and situation. As a general suggestion we would say for Cutlery, polished articles, &c., dark blues, bright greens and royal purples are very effective by way of contrast. For House Furnishing Goods, Water Coolers, Refrigerators, Freezers, &c., where one has a variety of colors in one assortment, light green or light blue is preferable for harmonious blending. For Japanned Goods, Coal Hods, Coal Vases, Enameled Wares, &c., white should be chosen. For Builders' Hardware, Bronzed or Brass Goods, Door Locks, &c., black or any dark color is more suitable. These goods can be secured at any dry goods store for a small consideration, and may be put upon the walls in pleats, plain or puckered or gathered to suit the individual taste of the artist making the display.

ONE AT A TIME.

The most effective story in a window is that telling of one thing at a time. There should be no attempt at too great a variety. One should not try to show all the goods in stock in one display. Treat one subject at a time and change the windows often if you have a great deal to show. If it is Cutlery, show nothing but Cutlery, and try to show all the different styles rather than all the goods in stock. If it is House Furnishing Goods, one may indulge in somewhat more variety, but even then the goods should be classified.

GOODS YIELDING BEST RETURNS.

The kinds of goods yielding best returns in window displays depend entirely upon the location and class of trade being catered to by the merchant. Obviously a merchant will get little returns from a display of Farming Implements shown upon a street largely traveled by city shoppers after Household Hardware. And a display of Builders' Hardware would yield poor returns if not seen by a class of tradesmen and working people. A merchant can soon determine which line is most profitable for window advertising. Neat window displays are always effective. The goods depend entirely upon the location of a store, the class of people who frequent the street and the season.

FREQUENCY OF CHANGING DISPLAY.

It is well to leave a pretty display in the window as long as it attracts, unless the conditions of weather and other circumstances require a change. Generally it is better to change often. The pedestrian will not be interested in the same thing day after day in passing your store, although there is a certain amount of new travel

by your windows every day. The frequency of changing a display depends upon conditions and circumstances. All localities are not alike in these, and a window which would continue to draw attention in one town will soon wear out in another.

SUCCESSFUL DISPLAYS.

Below are given brief descriptions of a number of windows trimmed by the writer, which have been successful, and have attracted their share of attention and favorable comment.

HOLIDAY CUTLERY DISPLAY.

While this, as shown in Fig. 1, was a comparatively plain display, it certainly showed up the goods to good advantage, and was a big trade winner. It did the business. Fig. 2 is an elevation of the front frame work, which was made of boards. The arrangement of the steps and the display boards in the back of the window are illustrated in Fig. 3.

The colors used in this window were white for the columns and frames around the display cards. Purple was used for trimming. All display cards were covered with dark green cloth. On the rear of the front arch were 15 blue electric lamps, so placed as not to be seen from sidewalk. They produced a good effect on the appearance of the goods in this display at night. The bright blades of steel, reflecting the blue rays of light, gave the goods the appearance of a royal blue temper, so much in vogue to-day.

CUTLERY DISPLAY.

This display, illustrated in Fig. 4, consisted of five oval and one circular display cards, set in a frame work, upon a series of steps upon which the display cards were used. The photograph shows very plainly the design of front arch work, and takes away the plainness and vacant look the window would have without it. The colors used in this display were white on front arch, border of bright red, background of sign of sky blue. The purple letters were cut from cardboard. The

Fig. 1.—Holiday Cutlery Display.

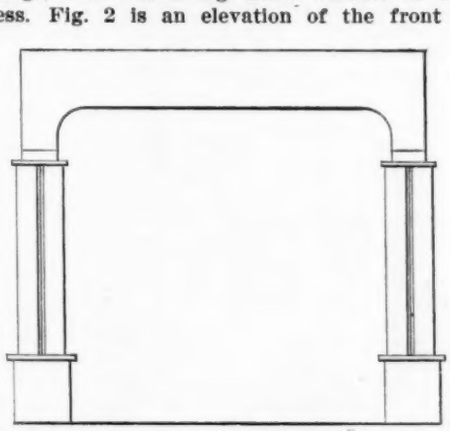


Fig. 2.—Front Frame Work for Holiday Cutlery Display.

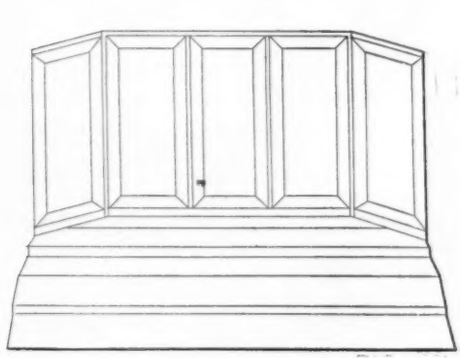


Fig. 3.—Arrangement of Steps, and Display Boards in the Rear.

square frame work was sky blue, all display cards royal purple. Almost every piece of goods in this display was marked with plain price cards and the window was a decided trade winner.

(To be continued.)

A PAINT DISPLAY.

Ready Mixed Paints are generally considered hard subjects with which to make pleasing window displays, but Burhans & Black Company, Syracuse, N. Y., have succeeded in producing a most attractive window with them, as is shown in the accompanying illustration. As will be seen, this display was made wholly of cans of Paint of various sizes, together with the material that is used in applying the same, with the exception of the stone steps and the work which represented stone around the fountain, which were made of Washita and other Carpenters' Stones. The spindle work on the balcony, as well as the fence at the rear of the fountain, were made up from Brushes of various sizes.

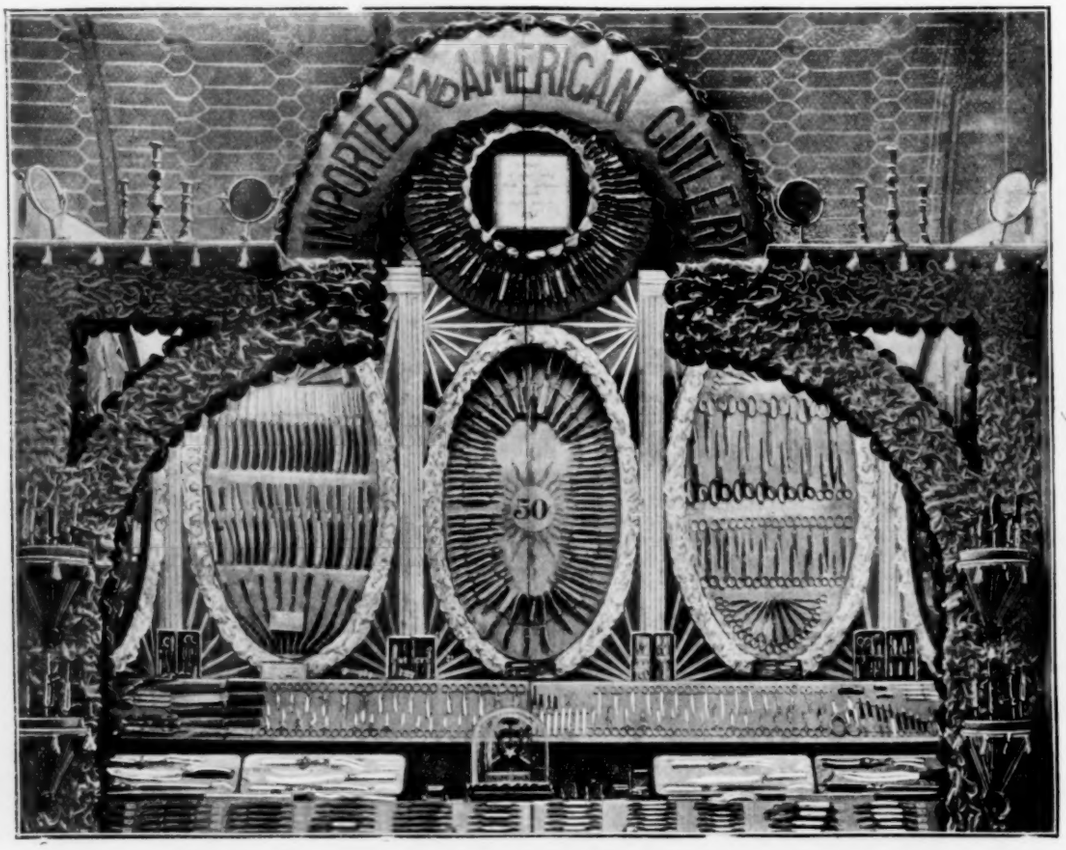
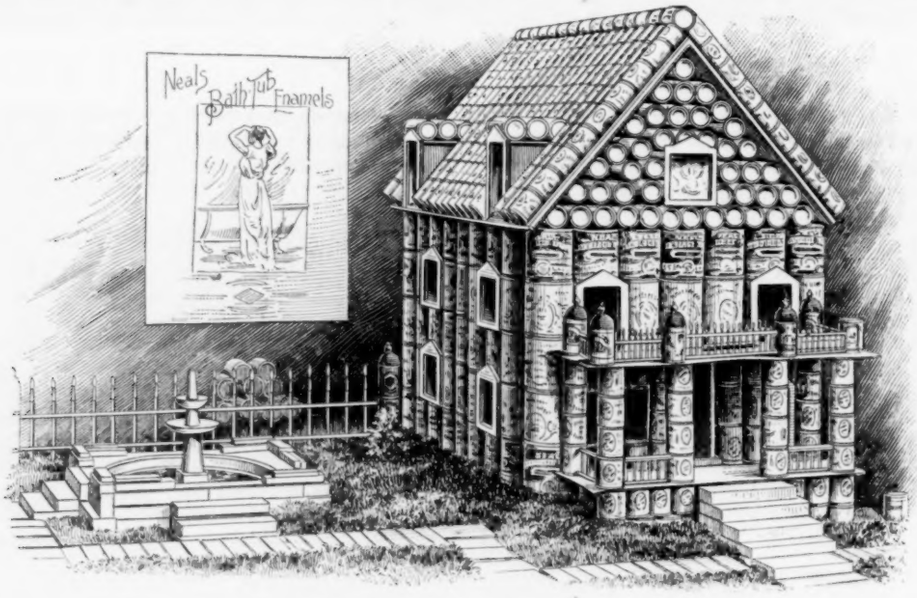


Fig. 4.—Cutlery Display.



A Paint Display.

Bohart-Morris Hardware Company, Harrison, Ark., wholesalers and retailers of Shelf and Heavy Hardware, Stoves, Tinware, Buggies, Wagons, &c., have recently completed a new building. It is of pressed brick, two stories high, and 25 feet wide by 100 feet long. The store is referred to as one of the most attractive in the State.

THE S. M. HOWES COMPANY.

THE S. M. HOWES COMPANY, 40-46 Union Street, Boston, Mass., have issued an illustrated catalogue and price-list of Fire Place Goods, made of brass, wrought iron and cast iron. The line includes Portable Grates, Andirons, Fire Sets, Fenders, Brass Coal Hods and Jamb Hooks, Folding Screens, Spark Guards, Hand Bellows, Hearth Brushes, Wood Baskets, Gas Logs, Fire Place Dampers, Ash Pit Doors and Dumps, Boiler Doors, Grates, &c.

MISCELLANEOUS NOTES.

Pflueger's Fishing Reels.

The Enterprise Mfg. Company, Akron, Ohio, for many years makers of fishing tackle, have recently begun the manufacture of a large and varied line of fishing reels. These include popular styles and sizes, in brass, nickel, German silver and rubber, suitable for all kinds of fishing in either salt or fresh water, including trout, bass, salmon, tuna, tarpon, &c. Different sizes of reels are made to hold from 40 to 350 yards of line. The company being the latest concern to enter this business advise us that they have made every endeavor to improve on the older styles of reels, and have, it is remarked, in many cases not only increased the size of the reel in the same class, but have added to the decoration of it, besides strengthening the weak parts, such as the crank, gears, bearings, &c. It is explained that the system in the factory is such that no reel passes into stock without first going through a rigid examination, and that when passed each one runs perfectly. The factory, it is stated, has a full equipment of the latest and most improved tools and machinery for the manufacture of reels, and is in charge of a man who has had over 30 years' practical experience in this line. Particular pains is taken with the finishing, plating, polishing, &c., of the goods.

Gast's Asbestos Air Cell Coverings.

F. J. Gast, 26 Cortlandt street, New York, is the manufacturer of Gast's asbestos air cell covering for hot air furnace pipes, furnaces, steam pipes, boilers, &c. One form of this material is put up in rolls of 250 square feet, it being 36 inches wide and ¼ inch thick. It consists of two thicknesses of sheet asbestos, one of which is plain or flat and the other corrugated, the two being cemented together to make a single sheet. When covering furnace pipes, for instance, it is wrapped around the pipe twice and fastened with iron or brass bands ¾ inch wide furnished for the purpose, or plain wire can be used. The same material is used on steam pipes. Another regular form of this material is made in sections 3 feet long by the manufacturer for 18 sizes of pipe, having a range of from ½ to 12 inch diameters. He also furnishes molded fittings for elbows of various angles, tees, valves and crosses. It can likewise be made for pipes up to 24 inches diameter. Still another form is in the shape of blocks or boards for covering boilers, 6 inches wide and 36 inches long, or in boards 36 x 36 inches square. The thicknesses vary according to nature of the use for which it is intended.

The Columbia Lock Nut.

The accompanying illustrations represent a lock nut offered by the Columbia Lock Nut Company, 489 Fifth avenue, New York City. As shown in Fig. 1 the nut consists of an inner and an outer shell, which when assembled are a unit. The inner nut, Fig. 2, which is threaded to receive the bolt, is slotted throughout its length and is tapped from above downward to fit and correspond with the taper of the outer shell or binding nut. Top and bottom views are given in Fig. 3 of the inner and outer nuts. The device is referred to as a combination of three mechanical powers—although only in two parts—the wedge, the screen and the lever. The following points of excellence are claimed for the nut by the manufacturers: That it is a positive nut which will remain indefinitely where placed: that it automatically fastens both bolt and nut absolutely; that it is a binding lock nut of immense power because the greater the strain the firmer the grip; that it does not injure the bolt and will never slack back or work loose; that it will straighten the threads of an abused bolt, thus avoiding

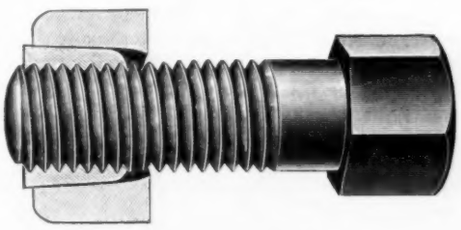
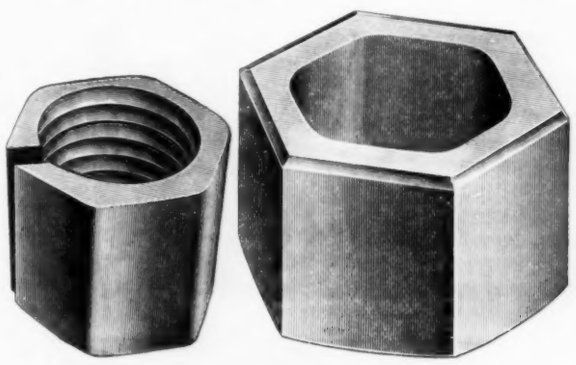


Fig. 1.—The Columbia Lock Nut on Bolt.

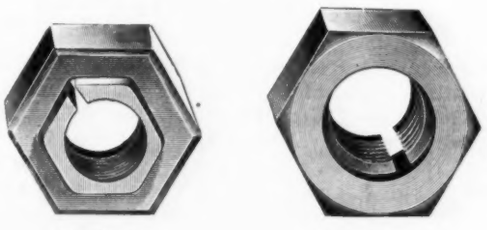
the necessity of recutting the threads; that it does not require exact size or taper bolt threads, as it readily receives full or scant diameter bolts; that no springs, washers, jam nuts, dogs, pawls, slots, pins or extra devices are necessary; that it is more effective than double nuts and stronger than rivets; that it will last a life time and can never injure itself; that it can be placed in



Inner Section. Outer Section.

Fig. 2.—The Columbia Lock Nut.

any position, and can at any time be removed without injuring the bolt or without any special tools; that it never diminishes its grip in expansion and contraction of metals, and that it is of universal application. It is recommended by the makers as effective on locomotives, pitmans, wrists, king bolts, rail joints, fish plates, piston rods, cylinder heads, steam pumps, air compressors and all kinds of machinery. It is also intended for use



Top View. Bottom View.

Fig. 3.—The Columbia Lock Nut.

on axles, automobiles, carriages, wagons, railroad cars and other vehicles. The nuts are furnished plain, semi-finished and finished, for bolts from ½ inch to 4 inches in diameter. The nut has been patented in the United States and all the principal countries of the world.

N. Jacobi Hardware Company, Wilmington, N. C., have recently enlarged their quarters and now occupy two storerooms and two warehouses, the whole aggregating more than 14,000 square feet of floor area. The business was established in 1856, and employment is given to 16 men, three being traveling salesmen, who cover North and South Carolina.

The Improved Samson Nail Puller.

Albert E. Rinn, Allentown, Pa., is offering the nail puller shown herewith. The rammer and standard are made of malleable iron to avoid breakage. The forgings are of steel and the jaws are suitably tempered. All parts are interchangeable. There is a handle near the base of the puller by which it is held in place by the operator's left hand. The base is also provided with an offset or standard to prevent the crushing or breaking of thin covers. The maker remarks that the puller does not pinch or bruise the operator's fingers, that it saves cases and light boxes, that nails, when pulled, must

The Improved Samson Nail Puller.

come straight, and that by the strength and positive leverage the puller will pull nails that are usually difficult, including spikes, cemented nails, staples, &c. The device is patented in the United States, Germany and England.

Screen Doors for 1902.

The Porter Screen Mfg. Company, Burlington, Vt., are putting on the market, for the coming season, the new screen doors shown herewith. These do not constitute the company's entire line, but are specimens of a few of the various grades made by them. The door shown in Fig. 1 is referred to as neat and simple in design. The ornamentation consists merely in the embossing of the center rails, the use of spindles between the rails and the general construction of the door in proper proportion. It is finished with one coat of varnish, and is sold at a moderate price. In Fig. 2 is shown a door, which, it is remarked, is different from anything offered to the trade. The edges and corners of the upper panel are chamfered and rounded, the top and center rails are curved, and the lower panel is strengthened and ornamented by two columns of spindles supporting an arch of spindles which follows the curve of the middle rail. The bottom rail is 10 inches wide, or 4 inches wider, it is remarked, than rails to screen doors are ordinarily made. The wire cloth is covered by raised molding. The door shown in Fig. 3 is 1⅛ inches thick, and is alluded to as neat, plain in design, but rich in workmanship and finish. What is referred to as the company's best door is illustrated in Fig. 4. They state that they have not spared any pains to make this door both handsome in design and as good as possible. It is made of the best Northern pine. After the frame is assembled the entire door is run through a sanding machine and nicely smoothed and polished.

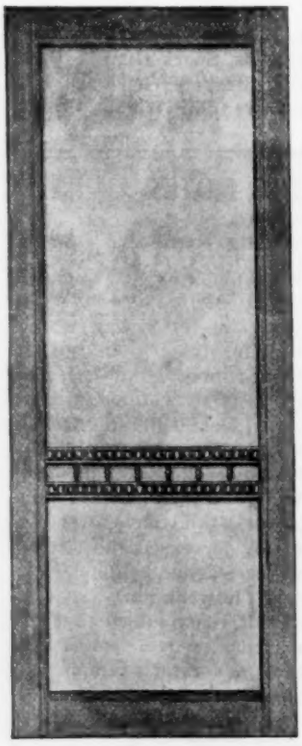


Fig. 1.—Screen Door No. 200.

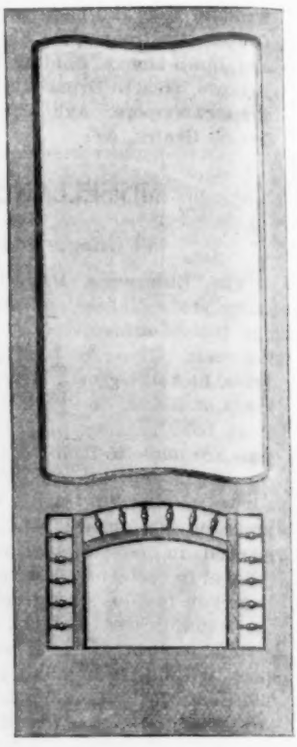


Fig. 2.—Screen Door No. 604.

The makers state that every joint is perfect, and that the door receives what they would call a piano finish. The solid panel gives strength to the door. The decoration of the door consists of genuine carvings, not em-

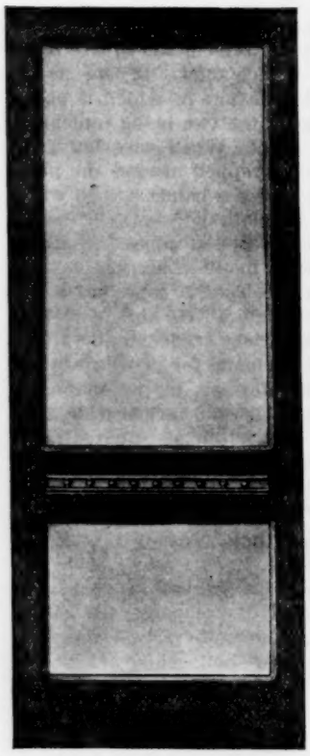


Fig. 3.—Screen Door No. 810.

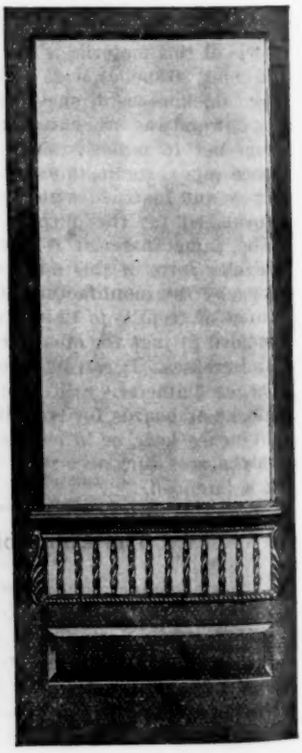


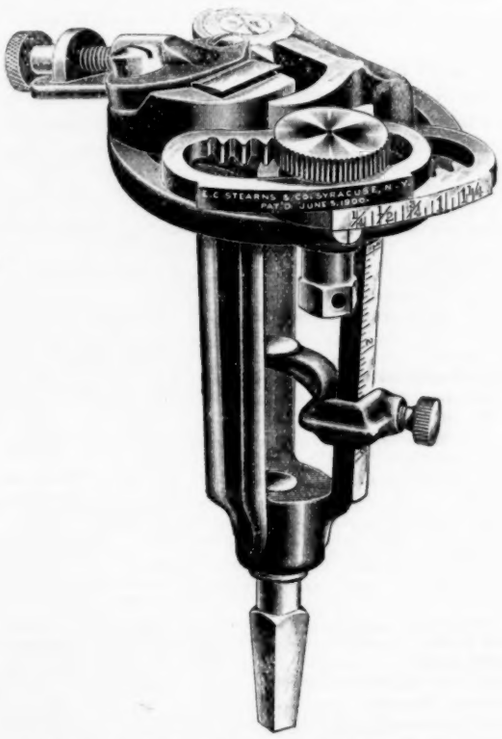
Fig. 4.—Screen Door No. 804.

bossings, and of open twist spindles. This is a new variety of spindle which, it is pointed out, has only been used in the past in furniture work of exceptional quality. The carvings of the door are connected by rope

twist moldings and spindles, and the carvings are protected by a raised water table. These doors are packed one-sixth of a dozen assorted sizes in a crate. The door, it is claimed, is a better one than it has been customary for the retailer to handle, although there has always been a demand for a better screen door than the usual make. For this reason the company are offering the door put up in such quantities that every retailer may put in a fair assortment.

Stearns' New Adjustable Hollow Auger No. 33.

The accompanying cut represents a hollow auger offered by E. C. Stearns & Co., Syracuse, N. Y. The auger combines the desirable features of the company's No. 3 hollow auger, together with other improvements. Most prominent among the new features is the patented adjustment of the knife. The knife is slotted to receive a knurled head screw especially designed with a collar to

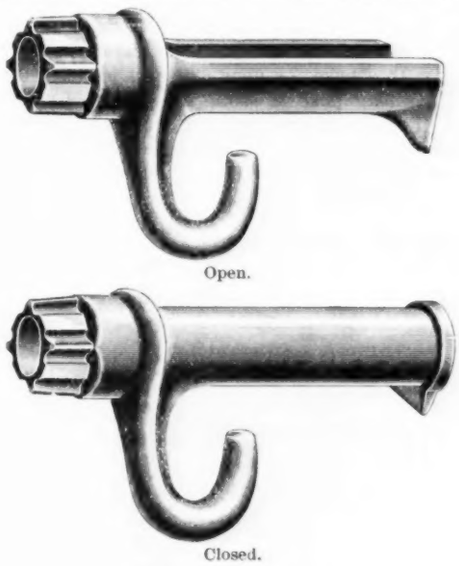


Stearns' New Adjustable Hollow Auger No. 33.

fit in the slot of the knife, and which adjusts the knife to any desired size of cut. It does away with the use of a screw driver and hammer in adjusting the knife. The screw turns easily between the thumb and forefinger, and is held by the collar so that the knife cannot work out of position. The auger cuts any size tenon, from ¼ to 1¼ inch. The pivoted jaws are provided with a graduated scale by which the size of the tenon is regulated. The required length of tenon is secured by a movable stop operated on a graduated scale, with rulings in sixteenths. The auger is furnished in lustrous black and red enamel baked on. All bright parts are polished and heavily nickel plated. The augers are packed one-sixth dozen in a box.

The Ideal Sap Spouts.

Charles Millar & Son Company, Utica, N. Y., are offering the sap spouts herewith shown, in open and closed top. They are made in one piece from the best malleable iron, tinned. Each kind is made to fit a hole bored with a ½-inch bit. The hook is combined with the spout, and the fluted or corrugated end is designed to admit the sap from all points. The spouts are made extra long so that all of the sap will drop into the bucket, and if necessary two spouts can be used with one bucket. Among the points of excellence claimed for the spouts are the following: That they will not break, that they are not liable to clog, that they will thaw out quickly when slightly frozen, that they will obtain a comparatively large quantity of sap from a tree, that they will not injure trees and that they will not drop out or loosen



Open.

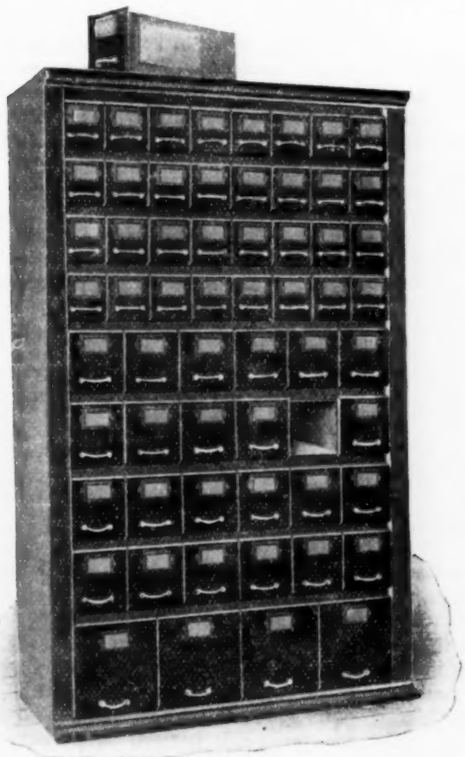
Closed.

The Ideal Sap Spout.

by frost. Both kinds are referred to as being handsomely finished, and are packed in pasteboard boxes containing 250 spouts in all of either kind.

The Heller Screw Case No. 1761.

The accompanying cut represents a new screen case put on the market by W. C. Heller & Co., Montclair, N. J. The case contains 60 steel dust proof drawers, arranged with divisions to contain 108 different size screens. It is explained that screens kept in this case will not rust or tarnish as the case has a steel back and



The Heller Screw Case No. 1761.

drawers, and that the drawers being dust proof will keep the contents in the same condition as if they were in the original packages. The case is well made in white wood, stained any color or solid oak exposure. Each drawer is fitted with a strong pull and card clip. The case takes little space, it is remarked, being 28 inches wide, 11 inches deep and 41 inches high.

The C Framed Jig Saw.

The Hawkins Mfg. Company, 591 Atlantic avenue, Boston, Mass., are manufacturing the C framed jig saw shown in the accompanying illustrations. Fig. 1 shows the saw with a base for floor use, and Fig. 2 shows the saw bolted to a post or wall. The latter style is also made with feet underneath for screwing to a bench. This saw is not intended for coarse and heavy work, but will saw up to 2½ inches thick and 16 x 24 inch swing in

Fig. 1.—Floor Saw, 18-Inch Swing.

a neat and satisfactory manner. It is stated that fine scroll sawing and inlaid work can be done with it to advantage. The floor saw shown in Fig. 1 is especially designed with change of speed for metal sawing as well as for wood. Any metal softer than the saw blade, it is stated, can rapidly be sawed, and it will run quietly and without vibration. The table can be tilted in either direction as far as 30 degrees. A blower is hidden in the frame where it is not liable to accident, and wind is conducted through a brass tube to the saw table. The saw

Fig. 2.—Saw Bolted to Post or Wall.

blades are held by hardened steel clamps and any tension can be given the saw by a quick action spring attached to the top of the frame. A pressure foot is provided for holding down the work when necessary. The belt is shifted by the foot. The manufacturers refer to the small amount of space the saw occupies and point to this fact with its low cost as making it a desirable machine especially for small pattern shops or private work.

The Board of Trade of Monroe, La., have issued a circular in the interest of that city, pointing out the inducements which it offers to manufacturers and others. Numerous illustrations are given of its public buildings, manufacturing plants, residences, &c. Among the business houses of which views are given is the large establishment of the Monroe Hardware Company.

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Current Hardware Prices.

REVISED NOVEMBER 4, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00...33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 7¼@7¾c
Hay-Budden, Wrought.....9@9¼c
Horseshoe brand, Wrought.....9@9¼c
Arm and Hammer, Wrought ₩ lb 8¼@8¾c

Imported—

Peter Wright's.....9¼@9¾c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@70&10%
Boring Machine Augers.....60&10&10@70&10%
Car Bits, 12-in. twist.....60@60&10%
Jennings' Pattern Auger Bits.....50&10&5@50%
Ford's Auger and Car Bits.....40&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, K. Jennings' list....40%
No. 80, K. Jennings' List.....50%
Russell Jennings'.....35&10&5@35&10&5%
L'Hommedieu Car Bits 15&10@15&10&5%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50&10%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (K. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $18; large, $26.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....6%

Gimlet Bits—

Common Double Cut..gro. $2.25@2.75
German Pattern.....gro. $3.25@4.50

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames.....25&10%
New Patent.....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered..gro. 65@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered..gro. 65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands, $5.50@5.75
First Quality, other brands $5.25@5.50
Jobbers' Special Brands:
Good Quality.....$4.50@4.75
Best Quality.....$5.00@5.25
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—*Iron or Steel.*

Concord, Loose Collar....4½@5c
Concord, Solid Collar....4¾@5¼c
No. 1 Common.....3¾@3¾c
No. 1½ Com. New Style..3¼@4 c
No. 2 Solid Collar.....4¼@4½c
Nos. 11 to 14.....70@70&10%
Nos. 15 to 18.....75@75&10%
Nos. 19 to 22.....75@75&10%

5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned.. lb. 4¼@4½c
Common and Concord, turned.. lb. 4¾@5c
Half Patent.....lb. 8@9c

Balances—Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances ... 50&10@50&10&5%
Chatill on's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%
Pendulum.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb.. 2¾@3c

Beams, Scale—

Scale Beams, List Jan. 12, '85..40&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, ₩ gro. $6.50
No. 10 Cast Handle Dover, ₩ gro. $8.00
No. 10 Steel Handle Dover, ₩ gro $8.00
No. 15 Extra Heavy Steel Handle, ₩ gro. $15.00
Rival, ₩ gro.....$10.00
Taplin Mfg. Co.: ₩ gro.
No. 50 Small Family size.....$6.50
No. 100 Regular Family size.....$8.00
No. 102 Regular Family size tinned.....$9.50
No. 150 Large Family size.....$15.00
No. 152 Large Family size, tinned.....$17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (S. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List..70@70&10%
C. E. Jennings & Co., Blacksmith..60&10%
C. E. Jennings & Co., Hand.....33⅓&5%

Blacksmiths—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:

Each	*$4.00*	*4.55*	*5.10*	*5.60*	*6.40*	*7.50*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.7*	*6.75*

Net Prices.

Bells—Cow—

Ordinary goods.....75&5@75&10%
High grade.....70@70&10%
Jersey.....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....40&40&10%
Yankee Gong.....35%

Hand—

Hand Bells, Polished.....60&5@66⅔%
White Metal.....55@55&10%
Nickel Plated.....50@5 0&10%
Swiss.....60@60&10%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb 2@2½c
Steel Alloy Church and School.....50&10&5@60%
National Bell Foundry Co.:
Superior Cast Steel Church and School Bells.....50&10&5@60%
Wilmot & Hobbs Mfg. Co., Gongs.....70%

Belting—Rubber—

Agricultural (Low Grade).75&10@80%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10&5%
High Grade.....60&10@60&10&5%
Boston Belting Co.:
Seamless Stitched, Imperial.....
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap...50&10@60%
Regular Short Lap.....60@60&5%
Standard.....60&10@65&10%
Light Standard.....65@70%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40&50%

Bicycle Goods—

John S. Leng's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70&10@75%
Cleveland's Steel.....60&10@70%
Ford's Star Brand Self Lubricating.....60&10%
Hollow Steel, Ford's Pat. Star Brand.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50&10%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c.....40&10@..%

Bolts—Carriage, Machine &c.—

Common, list Jan. 30, '95...65&2½@..%
Norway Iron, $3.00, list Oct. 7, '85...80@30&5%
Phila. Eagle, $3.00 list May 24, '99.... 80@30&10%
Bolt Ends, list Jan. 30, '95...70&5@..%
Machine, list Oct. 1, '99.....70&2½@..%
Machine with C. & T. Nuts..... 65&7½@..%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.28*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel.....70&10@75&5%
Wrought " Bronzed..40&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60&5@..%
Stove.....77½%

Tire—

Common.....77½%
Norway Iron.....30@30&5%
American Screw Company:
Norway Phila., list Oct. 16, '84....82½%
Eagle Phila., list Oct. 16, '84.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..83½%
Eagle Phila., list Oct. 16, '84.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila. list Oct. '84.....85%
Norway Phila., list Oct. '84.....82½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.30*	*5.00*	*6.75*	*7.25*
Inch		*2¼*		*2½*
Per Doz.....		*$8 65*		*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boring Machines—*See Machines, Boring.*

Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*

Common Ball, American..$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Patent..50%
P., S. & W. Co Peck's Patent.....60&10@65&5%

Brackets—

Wrought Steel.....75&5@75&10%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....75%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Boss.....₩ gro. $48.00
Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96.....40@40&5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50&10%
Fast Joint, Narrow.....50@50&10%
Loose Joint.....70&5@70&10%
Loose Pin.....70&5@70&10%
Mayer's Hinges.....70&5@70&10%
Parliament Butts.....70&5@70&10%

Wrought Steel—

Table and Back Flaps...60&10%
Narrow and Broad.....60&10%
Inside Blind.....60%
Loose Pin.....60&10%
Loose Pin, Ball and Steeple Tip.....70&10%
Japanned, Ball Tip Butts...60%
Bronzed Wrt. Nar. and Inside Blind Butts.....45&20@45&25%

Extra 25@ 35&5%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses, Calks, Toe and Heel—*

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern...	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	20	30	40	qts.
New York Patt'rn	3.00	3.25	3.40	each.
Baltimore Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro

Caps—Percussion—

Eley's E. B.....60c
G. D.....per M 32@34c
F. L.....per M 37@40c
G. E.....per M 47@50c
Musket.....per M 57@60c

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (Sturtevant Shells) *$1.00.....5%*
All other primers.....$1.10@$1.15

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
32 C. F., .55 ..... 10&5@10&10%
.38 C. F., .90 ..... 10&5@10&10%
22 cal. Rim, $1.50 ..... 10&5@10&10%
32 cal. Rim, $2.75 ..... 10&5@10&10%
B. B. Caps, Con., Ball Swged. $1.80@1.85
B. B Caps, Round Ball... $1.10@1.15
Central Fire ..... 25@25&5%
Pistol and Rifle ..... 15&5@15&10%
Primed Shells and Bullets ..... 15&5@15&10%
Rim Fire Sporting ..... 50@50&5%
Rim Fire, Military ... 15&5@15&10%

Casters—
Bed ..... 70@70&10%
Plate ..... 75@75&10%
Philadelphia ..... 75@75&10%
Boss ..... 70&10%
Boss Anti-Friction ..... 70&10%
Martin's Patent (Phoenix) 45%
Payson's Anti-Friction ..... 70&10&10%
Standard Ball Bearing 45%
Tucker's Patent, low list 80%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
American Coil, Cask lots:

3-16	*¼*	*5-16*	*⅜*	*7-16*	*½*	*9-16*
8.00	*6.00*	*5.00*	*4.25*	*4.10*	*4.00*	*4.75*
⅝	*¾ to 1 in.*			*⅛ to 1¼ inch.*		
3.85	*3.80*			*3.75 per 100 lb.*		

Less than Cask lots add 25c.
German Coil, list July 24, '97. 60&10&10%

Halters and Ties—
Halter Chains ..... 50&10%
German Halter Chain, list July 24, '97 ..... 60&10&10%
Cow Ties 60%

Trace, Wagon, &c.—
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring ... $30.00
6½—6-2, Straight, with ring .. $31.00
6½—8-2, Straight, with ring .. $35.00
6½—10-2, Straight, with ring .. $38.00
Add 2¢ per pair for Hooks
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains .. 50&10@55&10&10%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron ..... 60@60&10%
Brass ..... 60@60&10%
Safety Chain ..... 70 &5@70&10%
Gal. Pump Chain ..... lb. 4½@4½c
Covert Mfg. Co.:
Breast ..... 35&2%
Halter ..... 35&2%
Heel ..... 35&2%
Rein ..... 35&2%
Stallion ..... 35&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back 70%
Rein 70%
Oneida Community:
Am. C'll and Halters ..... 40@45&5%
Am. Cow Ties ..... 45@50%
Eureka Coll and Halter ..... 5@50&5%
Niagara Coll and Halter ..... 45@50&5%
Niagara Cow Ties ..... 45&5@50&10&5%
Wire Dog Chains ..... 45@50&5%
Wire Goods Co.:
Dog Chain ..... 60&10%
Universal Dbl-Jointed Chain 50%

Chalk—(From Jobbers.)
Carpenters' Blue ..... gro. 42@45c
Carpenters', Red ..... gro. 37@40c
Carpenters', White ..... gro. 33@35c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's ..... 40&10%
Columbia ..... 50&10%
Eclipse ..... 60@60&10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools 55%
Youths' Chests, with Tools 40%
Gentlemens' Chests, with Tools 40%
Farmers', Carpenters', etc, Chests, with Tools 30%
Machinists' and Pipe Fitters' Chests, Empty 50%
C. E. Jennings & Co.'s Machinists' Tool Chests 20%

Chisels—

Socket Framing and Firmer
Standard List ..... 70@65@7 &10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Socket Firmer No. 10 ..... 60&10%
C. E. Jennings & Co. Socket Framing No. 15 ..... 60&10%
Swan' ..... 70&5%
L. & I. J. White ..... 30@30&5%

Tanged—
Tanged Firmers ..... 40@5@40&10%
Buck Bros 30%
Charles Buck 30%
C. E. Jennings & Co. Nos. 19, 181, 225
L. & I. J. White, Tanged ..... 25&5%

Cold—
Cold Chisels, good quality lb. 13@15c
Cold Chisels, fair quality .. lb. 11@12c
Cold Chisels, ordinary ..... lb. 8@9c

Chucks—
Beach Pat., each $8.00 ..... 20%
Massey's Planer and Milling ..... 15@20%
Skinner Patent Chucks:
Combination Lathe Chucks 40%
Drill Chucks, Patent and Standard .. 30%
Drill Chucks, New Model 20%
Independent Lathe Chucks 40%
Improved Planer Chucks 25%
Universal Lathe Chucks 40%
Face Plate Jaws 40%
Standard Tool Co.:
Improved Drill Chuck 45%
Union Mfg. Co.:
Combination 40%
Czar Drill 30%
Geared Scroll 30%
Independent 40%
Union Drill 30%
Universal 40%
Face Plate Jaws 35%

Clamps—
Adjustable, Hammers' ..... 20@20&5%
Cabinet, Sargent's ..... 5&10%
Carriage Makers', P., S. & W. Co. 40&10%
Carriage Makers' Sargent's ..... 5&10%
Bes't Parallel ..... 33⅓&10%
Lippincott's, Unica Drop Forge & Tool Co 40%
Saw Clamps, *see Vises, Saw Filers'.*

Cleaners Sidewalk—
Star Socket, All Steel ..... $ doz. $4.00 net
Star Shank, All Steel ..... $ doz. $3.75 net
W. & B. Shank, All Steel, 7½ in. $ doz., $3.05; 8 in., $3.10; 8½ in., $3.25.

Cleavers, Butchers'—
Foster Bros. 30%
New Haven Edge Tool Co.'s 40%
Fayette R. Plumb ..... 30@33⅓&10%
P., S & W ..... 50@50&5%
L. & I. J. White 25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet ..... $ doz. $7.20
Mascotte Toilet ..... $ doz. $3.40
Monitor Toilet ..... $ doz. $9.00
Stewart's Patent ..... $ doz. $10.00

Clips Axle—
Eagle and Superior ¼ and 5-16 inch ..... 70&10%
Norway, ⅛ and 5-16 inch .. 70@7 &10%

Cloth and Netting, Wire—
See Wire, &c.

Cocks, Brass—
Hardware list:
Compression and Plain Bibbs. 65&5%
Globe, Kerosene, Racking, &c. ..
Cocks ..... 65&10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list 40%
Embossed, Gilt, Pope & Stevens' list 30&10%
Leather Pope & Stevens' list 40%

Compasses, Dividers, &c.
Ordinary Goods ..... 70&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Call's Patent Inside 55%
Calipers, Double 65%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Compasses 50%
J. Stevens A. & T. Co ..... 25&10%

Compressors Corn Shock—
J. R. Hughes' $ doz. $2.50

Conductor Pipe, Galva.—
L. C. L. to Dealers:

Territory.	*Not nested.*	*Nested.*
Eastern	*70&2½%*	*70&5%*
Central	*65&10%*	*70%*
Southern	*65%*	*65&2½%*
S. Western	*60&12½%*	*60&15%*

Terms 2% for cash.
Jobbers receive extra 12½&2½ on carloads loose, and extra 12½ on carloads crated.
See also *Eave Troughs.*

Coolers, Water—

Nos.	3	4	6
Labrador	$11.50	$14.00	$17.50	$20.00

Nos.

	3	4	6	8
$2 00				
Iceland	$23.00	$25.00	$19.00	$37.50
10	14 cal.			
$57.00	$72.00			

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—
Braided, Drab ..... lb. 25c
Braided, White, Common .. lb. 17@18c
Cable Laid Italian .. lb. A, 18c; B, 16c
Common India ..... lb 9 @9½c
Cotton Sash Cord, Twisted ... 12@16c
Patent Russia ..... lb 12½@13c
Cable Laid Russia ..... lb. 13½@14c
India Hemp, Braided ..... lb 14@15c
India Hemp, Twisted ..... lb. 10@12c
Patent India, Twisted ... lb. 10@12c
Pearl Braided, cotton ..... $ lb 17@18c
Massachusetts, White ..... $ lb 22½c
Massachusetts, Drab ..... $ lb 26½c
Eddystone Braided Cotton ..... $ lb 19c
Harmony Cable Laid Italian ..... $ lb 18c
Ossawan Mills:
Crown, Solid Braided White ... $ lb 22c
Braided, Giant, White ..... $ lb 20c
Peerless:
Cable Laid Italian 16c
Cable Laid Russian 14c
Cable Laid India 12c
Braided India 18c
Phoenix, White 19c
Samson, Nos. 7 to 12:
Braided, Drab Cotton ..... $ lb 32½c
Braided, Italian Hemp ..... $ lb 32½c
Braided, Linen ..... $ lb 49c
Braided, White Cotton, Spot. $ lb 28½c
Nos. 6 to 4, 1¢ extra.
Silver Lake:
A quality, Drab, 40¢ 15%
A quality, White, 35¢ 15%
B quality, Drab, 35¢ 15%
B quality, White, 30¢ 15%
Italian Hemp, 40¢ 15%
Linen, 57½¢ 15%

Wire, Picture—
Braided or Twisted ..... 85@85&10%
Note.—There is a good deal of confusion in lists, some using old list and others the new list.

Corn Knives and Cutters—
See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant ..... $ gr. $34.00

Cradles—
Grain 50%

Crayons—
White Round Crayons, gross .. 5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square ..... gr. $1.50
Rolling Mill Crayons ..... gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy ..... $ doz. $7.00
Fort Madison, Light ..... $ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden ..... $ doz. $10.00

Cutlery, Table—
International Silver Company:
No. 12 Medium Knives, 1847. $ doz $3.50
Star, Eagle, Rogers & Hamilton and Ancnor ..... $ doz $3.00
Wm. Rogers & Son ..... $ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt Medium Knives ..... $ doz. $3.00
No. 7 Medium Knives ..... $ doz. $2.50

Cutters— Glass—
H. H. Mayhew Co 40%
Smith & Hemingway Co 50%

Meat—
Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz .. $10.80 13 20 18.00
American 30%

Nos	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Connecticut 50%

No	20	40	60	10	12
each	$1.75	2.00	2.25	3.00	8.00	4.00

Enterprise ..... 25@25&7½%

Nos	5	10	12	22	32
Each	$2	$3	$2.50	$4	$6

Dixon's, $ doz. ..... 30&10&40%

Nos	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, $ doz. $22.75 ..... 50&10%
Little Giant, $ doz ..... 33⅓&5@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$74.00	$68.00

Sterling ..... 33⅓&5%

Nos	1	2
Each	$2.00	$2.50

New Triumph No. 605, $ doz. $24.00 .. 30&10@40%

Nos	100	150
	$15.00	$18.00

Woodruff's, $ doz ..... 30&10@40%
Chadborn's Smoked Beef Cutter, $ doz. $60.00
Enterprise Beef Shavers ..... 25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c 40%
Kraut Cutte 24 x 7, 26 x 8, 30 x 9. 55%
Kraut Cutters 36 x 12, 40 x 12 ..... 40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters 40%
Slaw Cutters, 1 Knife, $ gr. ... $18@$20
Slaw Cutters, 2 Knife, $ gr. ... $22@$30

Tobacco—
All Iron, Cheap ..... doz. $4.25@$4.50
Enterprise ..... 25@50%
National, $ doz. $21.00 ..... 40%
Sargent's, $ doz., No. 2 ..... 45&10%
Sargent's No 2 and 21 ..... 50&10%

Washer—
Appleton's, $ doz. $16.00 .... 50&10&10%
Bonney's 40%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger ... per doz., $9.00
Iwan's Improved Post Hole Auger 40%
Iwan's Perfection Post Hole Digger:
$ doz. $9.00
Kohler's Universal ..... $ doz. $14.00
Kohler's Little Giant ..... $ doz. $14.40
Kohler's Hercules ..... $ doz. $12.00
Kohler's Invincible ..... $ doz. $10.00
Kohler's Rival ..... $ doz. $9.00
Kohler's Pioneer ..... $ doz. $9.00
Never-Break Post Hole Diggers, $ doz. $24.00 ..... 60%
Samson, $ doz. $34.00 ..... 25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Doors, Screen—
Porter's Plain, No. 6 ..... $ doz. $6.50
Porter's Ornamental, No. 70. $ doz. $10.00

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, $ doz. $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill ... each $1.50@$1.75
Blacksmiths' Self-feeding ..... each $3.75@4.00
Breast, Millers Falls, each $3.00 .. 15&10%
Breast, P., S. & W ..... 40@40&5%
Goodell Automatic Drills .. 40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3 ..... 10@5%
Johnson's Drill Points ..... 25&10%
Ratchet, Curtis & Curtis 25%
Ratchet, Parker's 40%
Ratchet, Weston's ..... 20@25%
Ratchet, Whitney's, P. S. & W 50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ..... 33⅓%

Twist Drills—
Standard List ..... 60@55@65&5%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Screw Driver Bits ... per doz. 45@70c
Balsey's Screw Holder and Driver, $ doz. ½-inch, $6; 4-in., $7.50 6-in., $9 .. 40%
Buck Bros 30%
Buck Bros' Screw Driver Bits 30%
Champion ..... 40 &10%
Douglass Mfg. Co ..... 20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet 35%
Goodell's Automatic ..... 50&10&10@50&10&10&5%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 40&10%
New England Specialty Co ..... 50&10%
Sargent & Co.'s:
Nos. 1, 50, 55 and 60 ..... 50&10&10%
Nos. 20 and 40 ..... 60½&10%
Smith & Hemenway Co ..... 40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles ..... 60&10%
No. 86 ..... 70&10%
Swan's:
Nos. 65 to 68 ..... 50%
No. 40 ..... 40&10%
Nos. 25, 35 and 45 ..... 20&10&10%

Eave Trough Galvanized
Territory. L. C. L.
Eastern ..... 75¢ 10% — Carloads extra 12½%
Central ..... 75¢ 7½%
Southern ..... 70¢ 12½%
S. Western ..... 70¢ 10%
Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Egg Beaters—See *Beaters, Egg*

Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments ..... 60@60&10%
Perfect Elbows (S. S. & Co.) 40%

Emery, Turkish—
4 to 16 5 to 150 Flour
Kegs ..... lb. 5c 5½c 5½c
½ Kegs ..... lb. 5½c 5¾c 5¾c
Kegs ..... lb 5c 6c 6c
10-lb cans, 10 in case 6¾c 7c 6c
10-lb. cans less than 10 10c 10c 8c
Note.—In lots 1 to 3 tons a discount of 10% is given.

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's ..... 50&10%

Faucets—
Cork Lined ..... 70 &5@70&10@5%
Metallic Key, Leather Lined ..... 70@70&10%
Red Cedar ..... 50@50&5%
B. & L. B. Co.:
Lockport, Metal Plug, reduced list 60&5%
Star ..... 60@60&5%
Star, Metal Plug new list .... 40@40&5%
West's Lock, Open and Shut Key 50&10%
John Sommer's Peerless Tin Key 40%
John Sommer's Boss Tin Key 50%
John Sommer's Victor Metal Key. 50&10%
John Sommer's Daudlex Metal Key 60%
John Sommer's Diamond Lock 40%
John Sommer's I. X. L. Cork Lined .. 50%
John Sommer's Reliable Cork Lined ..... 50&10%
John Sommer's Chicago Cork Lined .. 60%
John Sommer's O. K. Cork Lined 50%
John Sommer's No Brand, Cedar 30%
John Sommer's Perfection Cedar 40%
McKenna, Brass:
Burglar Proof, N. P. 35%
Improved, ¾ and ⅞ inch 35%
Self Measuring:
Enterprise, $ doz. $30.00 ..... 40&10%
Lane's, $ doz. $30.00 ..... 40&10%
National Measuring, $ doz. $36.00 .. 40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands ..... 70@75&5%
Good Brands ..... 75&10@75&10&10%
Fair Brands ..... 80@80&10%
Second Quality ..... 80&10@80&25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97 ..... 25%

Fixtures, Grindstone—
Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz	*$2.60*	*2.75*	*3.00*	*3.50*	*4.40*

P., S. & W. Co ..... 50@50&5%
Keating Hardware Co 60%
Sargent's ..... 60&10&10%
Stowell's Giant Grindstone Hanger, $ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy ..... 50&10&10%
Stowell's Grindstone Fixtures Light. 60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 18 to 20 inches ..... 70c 6% — Extra 1 @ 5%
*Hay, 2 tine ..... 65% *
Hay, 3 tine 66⅔%
Hay, 4 tine, Header and Barley Forks, 13 to 16 inches 66⅔%
*Manure, 4 tine ..... 70% *
Manure, 5 and 6 tine 70%
Spading 70c 5%
Iowa Dig-Eez Potato 65%
Victor, Hay 66⅔%
Victor, Manure 70%
Victor, Header ..... 60&10%
Champion, Hay 66⅔%
Champion, Manure 70%
Columbia, Hay ..... 66⅔&5%
Columbia, Manure 70%
Columbia, Spading 70%
Hawkeye Wood Barley 4 tine $ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger 65%
Acme Hay ..... 60&10&7½%
Acme Manure, 4 tine ..... 60&20&10%
Acme Manure, 6 tine ..... 66⅔&10&2%
Dakota Header ..... 65&15&5%
Jackson Steel Barley ..... 65&15&5%
Kansas Header 66⅔%
W. & C. Favorite Wood Barley 4 tine, $ doz., $5.00; 6 tine, $6.00
Plated.—See *Spoons.*

Frames— Saw—
Red, Polished and Varnished .. doz. $1.15@$1.30
White ..... doz. 75@80

Screens and Frames—
See *Screens.*

Freezers Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best	*$1.45*	*1.65*	*1.95*	*2.40*	*3.30*	*4.20*
Good	*$1.25*	*1.40*	*1.70*	*2.15*	*2.75*	*3.75*
Fair	*$1.00*	*1.10*	*1.30*	*1.75*	*2.30*	*3.00*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp Fuse $2.60
Cotton Fuse 2.90
Single Taped Fuse 3.25
Double Taped Fuse 4.20
Triple Taped Fuse ..... 5.00 — Extra 20%

Gates, Molasses and Oil—

Stebbins' ..... 80@80&10%

Gauges—

Marking, Mortise, &c. .....
55&10@55&10&10%

Barrett's Comb. Roller Gauge .....
₱ doz. $6.75@7.25

Stanley R. & L. Co.'s Butt & Babbet Gauge ..... 20&10%

Wire, Brown & Sharpe's 25%

Wire, Morse's 25%

Wire P., S. & W. Co ..... 30@30&10%

Gimlets—Single Cut—

Nail, Metal, Assorted, gro. $1.40@1.60
Spike, Metal, Assorted gro. $2.80@3.25
Nail, Wood Handled, Assorted, gro. $1.75@2.00
Spike, Wood Handled, Assorted gro. $2.25@2.50

Glass, American Window

Jobbers' List, Jan. 21, 1901

Less than Carloads ..... 80&20%
Carloads ..... 85&5%
500 Boxes 57%

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. ..... 37½@50%
List B, Cans (½ pts., pts., qts.) ..... 33⅓@48%
List C, Cans (½ gal., gal.) ..... 25@45%
International Glue Co. (Martin's) ..... 40&10&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Common Grade ..... *gro. $5.00@6.00*
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs..₱ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake: 1 qt. cans, per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%

Grindstones—

Bicycle Emery Grinder $6.50
Bicycle Grindstones, each ..... $2.50&3.00
Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.. $2.00 }
Pike Mower Knife and Tool Grinder, each ..... $6.00 } 33⅓%
Velox Ball Bearing, mounted, Angle Iron Frames ..... each, $3.25

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000 ..... $9.00
Copper ₱ 1000 ..... $18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts Awl— *gro.*

Peg Patent, Leather Top..$4.90@5.25
Peg Patent, Plain Top....$3.50@3.75
Sewing, Brass Ferrule.....$1.50@1.60
Saddlers', Brass Ferrule..$1.35@1.15
Pegs, Common ..... *$1.25@1.35*
Brad, Common ..... *$1.50@1.75*

Halters and Ties—

Covert Mfg. Co.:
Web ..... 45&2%
Jute Rope ..... 45&2%
Sisal Rope ..... 30&2%
Covert's Saddlery Works:
Web and Leather Halters 70%
Jute and Manila Rope Halters 70%
Sisal Rope Halters ..... 60&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties ..... 60&20%

Hammers—Handled Hammers—

Heller's Machinists' ..... 50@50&5%
Heller's Farriers' ..... 50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75 ..... 40&10%
Peck, Stow & Wilcox ..... 50&10%
Fayette R. Plumb:
Plumb, A. E. Nail..33⅓&5@33⅓&10&5%
Engineers' and B. S. Hand ..... 50&10&7½@50&10&10&7½%
Machinists' Hammers ..... 50&10@50&10&10%
Riveting and Tinners' ..... 40&7½@40&10&7½%
Sargent's C. S. New List 45%

Heavy Hammers and Sledges—

3 lb. and under...lb. 45¢
3 to 5 lb ..... lb. 36¢ } 80@50&10%
Over 5 lb..... lb. 30¢
Wilkinson's Smiths'.....9½¢@10¢ lb.

Handcuffs and Leg Irons

See *Police Goods.*

Handles—Agricultural Tool Handles—

Axe, Pick, &c ..... *60@50&10%*
Hoe Rake, Fork, &c ..... *60@50&10%*
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—

Atkins' ..... 40&5%
Champion ..... 45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assorted.....gro. $2.30@$2.50
Brad Awl ..... *gro. $1.25@$1.50*
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@$2.35; large, $2.50@$2.60.
Hickory Tanged Firmer, gro. ass'd $1.75@$2.20; large, $2.50@$3.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted.....gro. $1.60@$1.15
Hammer, Hatchet, Axe, &c.....60%
Hand Saw, Varnished, doz. 70@75c
Not Varnished.. ..... *55@60c*
Plane Handles:
Jack doz. 25c; Jack Bolted..55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c
Nicholson Simplicity File Handle, ₱ gro. ..... $0.85@$1.50

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Doz	$0.85	1.20	1.50	1.90	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Doz	$1.30	1.75	2.50	3.00

Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%
Elevator 40%
Railroad 55%
Cronk Hanger Co.:
Loose Axle 60%
Roller Bearing ..... 60&10%
Lane Bros.:
Parlor, Ball Bearing $4.00
Parlor, Standard $3.25
Parlor, New Model $2.75
Parlor New Champion 22½
Barn Door, Standard ..... 60&10%
Covered ..... 50&10&10&5%
Special ..... 60&10%
Lawrence Bros:
Advance 60%
Cleveland 70%
Crown 60%
New York 60%
Peerless ..... 60&10%
Sterling 60%
McKinney Mfg. Co.:
No. 1, Special, $15 ..... 60&10%
No. 2, Standard, $18 ..... 60&10%
Stowell Mfg. and Foundry Co.
Acme Parlor Ball Bearing 40%
Atlas 60%
Badger Barn Door 50%
Baggage Car Door 50%
Climax Anti-Friction 50%
Elevator 40%
Express 50%
Interstate 60%
Lundy Parlor Door 50%
Magic 50%
Matchless 60%
Nansen ..... 60&10%
Railroad 50%
Street Car Door 50%
Steel, Nos. 300, 404, 500.....40&15%
Stowell Parlor Door 50%
Wild West, Nos. 301, 401, 500..... 5%
Zenith for Wood Track 50%
Taylor & Boggs Foundry Co.:
Kidder's ..... 50&15&10&5%
Columbian Hdw. Co.:
American Trackless ..... 33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing ..... 60&10%
C. J. Roller Bearing ..... 60&10%
Cycle Ball Bearing 50%
Dwarf Ball Bearing 40%
Ives, Wood Track ..... 60&10%
L. T. Roller Bearing ..... 60&10&5%
New Era Roller Bearing ..... 50&10%
O. K. Roller Bearing ..... 60&10&5%
Prindle, Wood Track 60%
Richards' Wood Track 60%
Richards' Steel Track ..... 50&10%
Spencer Roller Bearing ..... 60&10%
Tandem Nos. 1 and 2 ..... 60%
Underwriters' Roller Bearing 40%
Wilcox Auditorium Ball Bearing 20%
Wilcox Barn Trolley No. 123 ..... 40%
Wilcox Fire Trolley, Roller Bearing 40%
Wilcox Le Roy Noiseless Ball Bearing 40%
Wilcox New Century ..... 50&10&10%
Wilcox Trolley Ball Bearing 40%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp ₱ doz. 50%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Best Brands ..... *50@50&10%*
Cheaper Brands ..... *60@60&10%*
Note.—Net prices often made.

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1838 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz pair	$0.75	1.45	2.90

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.60	.55	.52	.45

Mortise Reversible Shutter, (Buffalo, &c.)

No.	1	1½	2
Doz. pair	$0.65	.60	.55

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50 ..... 10%
Parker ..... 70&75%
Reading's Gravity ..... 75&10%
Sargent's, Nos. 1, 3, 5, 11 & 13 .....
70&10&70&20%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets, without screws, $1.80; with screws, $1.15.
Wrightsville H'dware Co.:
O. S., Lull & Porter..... ..80&2½%
Acme, Lull & Porter..... 75&10%
Queen City Reversible..... 75&10%
Stenger's Positive Locking, Nos. 1 & 3 ..... 70&10&5%
Shepard's Noiseless, Nos. 50, 65, 95 ..... 70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
1892, Old Pat'n. Nos 1, 1 & 5. ..75&7½%
Tip Pat'n, Nos. 1, 3 & 5 ..... 75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5 ..... 75&7½%
Shepard's Double Locking, Nos. 20 & 25 ..... 70&10%
Champion Gravity Locking, No. 75.. 75&7½%
Steamboat Gravity Locking, No. 10.. 75&7½%
Pioneer, Nos. 060, 45 & 5½..... 75&7½%
Empire, Nos. 101 & 103 ..... 70&7½%
W. H. Co.'s Mortise Gravity Locking, No. 2 ..... 60&10%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches	$1.80	1.90	2.65
Hinges only	$1.20	1.40	2.00
Latches only	.60	.60	.65

New England:

With Latch	doz.	@$1.55
Without Latch	doz.	@$1.25

Reversible Self-Closing:

With Latch	doz.	@$1.80
Without Latch	doz.	@$1.45

Western:

With Latch	doz.	$1.40@1.75
Without Latch	doz.	$0.95@1.20

Wrightsville H'dware Co.:
Shepard's or Clark's, doz. sets,

No.	1	2	3
Hinges with Latches.	$1.80	2.00	2.75
Hinges only	1.20	1.50	2.10
Latches only	.65	.65	.70

Spring Hinges—

Holdback, Cast Iron, gro ..... *$7.00@7.25*
Non-Holdback, Cast Iron ..... *gro. $6.50@6.75*
J. Bardsley 15%
Bardsley's Patent Checking 15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges 40%
Bommer Spring Hinges 40%
Chicago Spring Butt Co.:
Chicago 25%
Floor Hinge 50%
Garden City Engine House.. 25%
Keene's Saloon Door 25%
Triple End 50%
Hoffman Hinge & Foundry Co.:
No. 70 & 80 Holdback Detachable $8.50
Lawson Mfg. Co.:
Machine 35%
Matchless Pivot 45%
Payson Mfg. Co.:
Oblique ..... 50&10%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4 ..... ₱ gr. $9.00
New Idea No. 1 ..... ₱ gr. $9.00
New Idea, Double Acting 45%
Columbian Hdw. Co.:
Acme, Cast Steel 80%
Acme, Brass 20%
American 30%
Columbia, No. 14 ..... ₱ gr. $9.00
Columbia, No. 18 ..... ₱ gr. $25.00
Columbia, Adjustable 30%
Gem new list 25%
Clover Leaf ..... ₱ gr. $2.50
Oxford new list 25%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges....75%
Heavy Strap Hinges..80%
Light T Hinges.....70%
Heavy T Hinges.....66⅔%
Extra Heavy T Hinges... } *Extra 75&10%*
Hinge Haspa.....60%
Cor. Heavy Strap 80%
Cor. Ex. Heavy T...75&10%

Screw Hook and Strap. { *6 to 12 in...* *lb 3½c*; *14 to 20 in* *lb. 3 c*; *22 to 36 in* *lb. 2¾c*

Screw Hook and Eye:
¾ to 1 inch ..... *lb 5 c*
⅝-inch ..... *lb 6 c*
½-inch ..... *lb. 7 c*

Miscellaneous—

Hoffman's Steel Spring Butt Hinges.... 40&10%
Hoffman's Offset Refrigerator Hinges.. 40&10%

Hods, Coal—

	15	16	17	18 inch.
Galv. Open	$2.70	3.00	3.30	3.60 ₱ doz.
Jap. Open	$2.10	2.40	2.70	3.00 ₱ doz.
Galv. Funnel	$3.30	3.60	3.90	4.20 ₱ doz.
Jap. Funnel	$2.70	3.00	3.30	3.60 ₱ doz.

Hoes—Eye—

Scovil and Oval Pattern ..... *60&5@60&10&5%*
Grub, list Feb. 23, 1899.... 70@70&10%
D. & H. Scovil 35%

Handled—

Sept. 1, 1900, List:
Field and Garden ..... *75&2%*
Ladies', Boys', Toy and Onion... *70&10&10%*
Street and Mortar ..... *75&7½&2%*
Cotton ..... *70&10&10&5&2%*
Planters' ..... *70&30%*
Weeding *75%*
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe ..... 75&2%
Ft. Madison Crescent Cultivator Hoe, per doz ..... 75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight ..... ₱ doz. $4.50
Junior Size ..... ₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy, per doz.....75&2%
Warren Hoe 60%
W. & C. Ivanhoe ..... 75&2%
B. B. Cultivator Hoe ..... 75&10&2%
Acme Weeding ..... 75&10&2%
W. & C. Lightning Shuffle Hoe, ₱ doz. $4.85

Hog Rings and Ringers—

See *Rings and Ringers.*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow Ware—

See *Ware, Hollow.*

Holders—Bit—

Angular, ₱ doz. $24.00 ..... 45&10%

Door—

Empire 30%

File and Tool—

C. F. Jennings & Co.'s Mod. Tool Holders 33⅓%
Nicholson File Holders and File Handles 33⅓%

Hooks—Cast Iron—

Bird Cage, Reading 60%
Bird Cage, Sargent's List..... 50&10@60%
Ceiling, Sargent's List ..... 40&10%
Clothes Line, Hoffman's ..... 40&10%
Clothes Line, Reading List ..... 65&10@65&10&10%
Clothes Line, Sargent's List 50&10@50&10&10%
Coat and Hat, Sargent's List..... 45&10%
Clothes Line, Stowell's 70%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading ..... 70@75%
Coat and Hat, Wrightsville ..... 65&10%
Harness, Reading List ..... 70&10@75%

Wire—

Belt *80%*
Wire C & H Hooks..60¢&10@60¢10¢&5%
Atlas, Coat and Hat:
Single Cases 45%
10 Case Lots ..... 45&10%
Czar Harness ..... 50&10&5%
Wire Coat and Hat:
Acme 60%
B. B. 60%
V Brace, Chief and Czar. 60%
Gem 60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.50; 8 in., $1.75; 10 in., $2.00.
Cotton ..... *doz. $1.05@1.25*
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best..... $1.50 1.75 2.00
Common.. $1.30 1.50 1.50 1.60
Potato and Manure 70%
Whiffletrees ..... *lb. 4¼¢*
Hooks and Eyes:
Brass ..... *60¢10¢10@70%*
Malleable Iron ..... *70¢5@70¢10%*
Covert Saddlery Works' Self Locking Gate and Door Hook 60%
Crown Picture ..... 50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—

See *Shoes, Horse.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition ..... *ft. 4¼@ 4¾c*
3-ply Standard ..... *ft. 5 @ 6 c*
4-ply Standard ..... *ft. 8 @ 9 c*
3-ply extra ..... *ft. 9 @10 c*
4-ply extra ..... *ft. 11 @12 c*
Cotton Garden, ¾-in., coupled:
Low Grade ..... *ft. 6 @7 c*
Fair quality ..... *ft. 8 @9 c*

Irons—Sad—

From 4 to 10..... lb 3@3¼c
B. B. Sad Irons..... lb. 3½@4c
Chinese Laundry..... lb. 5@5½c
Chinese Sad..... lb. 3½@3¾c
Mrs. Potts', per set:

Nos.	50	55	60	65
	65@70c	60@65c	75@80c	70@75c

New England Pressing, lb.. 3½@3¾c

Soldering—

Soldering Coppers, 1 & 1¼ lb., 21@23c.; 2 lb., 19@21c
Covert Mfg. Co ..... 20&2%
Smith & Hemenway Co's Sets..... 70%

Pinking—

Pinking Irons ..... *doz. 50@60c*

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel ..... 45&2%
Covert's Saddlery Works':
Daisy ..... 60&10%
Victor ..... 60&10%
Lockport ..... 40@40&10%
Lane's Steel ..... 33⅓&5%

Kettles—

Brass, Spun, Plain ..... *20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Foster Bros.' Butcher, &c 30%
Hartzell Cutlery Co ..... 30&5%
Smith & Hemenway Co ..... 40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₱ doz. $3.25
Withington Acme, ₱ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List ..... *70&5@70¢10%*
Adjustable Handle 35%
Bradley's 35%
Cantelo's Folding ..... 50@50&5%
C. E. Jennings & Co. Nos. 45, 46.. 40&10%
Jennings & Grimm ..... 66⅔&5%
Swan's ..... 70&10&2½%
Watrous 25%
L. & L. J. White ..... 20&5@25%

Hay and Straw—

Lightning Pat'n....per doz $5.00....
Iwan's Sickle Edge ..... ₱ doz. $12.00
Iwan's Serrated ..... ₱ doz., $11.00
Lightning, (Genuine) ..... $6.25@6.50
Maine ..... ₱ doz. $8.50

Mincing—

Buffalo ..... ₱ gro. $15.00

Miscellaneous—

Farriers' ..... *doz. $2.00@3.00*
Wosenholm's ..... ₱ doz. $3.00@3.25

Knobs—

Base, 2¼-inch, Birch, or Maple, Rubber tip, gro ..... *$1.20@1.25*
Carriage, Jap, all sizes..gro. 30@33c
Door, Mineral ..... *doz. 60@65c*
Door, Por. Jap'd ..... *doz. 65@70c*
Door, Por. Nickel....doz. $2.00@2.10
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's ..... 60&10%

Ladders, Step Etc.—

Goshen Mfg. Co 50%

Ladies' Melting—

L. & G. Mfg. Co. 25%
P., S. & W. 5%
Reading 60%
Sargent's ..... 40@40&10%

Lanterns—Tubular—

Regular Tubular ..... doz. $4.35@4.75
Side Lift Tubular ..... doz. $4.75@5.25
Square Lift Tubular ..... doz. $4.75@5.25
Other styles ..... 40@10@40&10&5%

Bull's Eye Police—

No. 1, 2¾ inch $3.60
No. 2, 3 inch $4.00

Latches, Thumb—

Roggin's Latches ..... doz. $0@33⅓

Lawn Mowers—

See *Mowers, Lawn.*

Leaders. Cattle—

Small ..... doz. 50c; *large*, 65c
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Solid grip, Payson Mfg. Co. 80%
R. & S. 45%

Lines—

Wire Clothes, Nos...	18	19	20
100 feet	$2.20	2.00	1.65
75 feet	$1.80	1.70	1.35

Ossawan Mills.
Crown Solid Braided Chalk ..... 33⅓&5
Mason's, No. 0 to No. 5 ..... 33⅓&5
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3 ..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr. 30%

Locks—Cabinet—

Cabinet Locks ..... 33⅓@33⅓&2½%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Reading Hardware Co. 50%
R. & E. Mfg. Co. 50%
Sargent & Co. ..... 40@40&10%

Elevator—

Stowell's 40%

Padlocks—

Wrought Iron ..... 70&10@65@30&5%
R. & E. Mfg. Co. Wrt. Steel and brass. 50%

Sash, &c.—

Fitch's:
Bronze and Brass 66⅔%
Iron 70%
Ives' Patent:
Bronze and Brass 62½%
Iron 65%
Wrought Bronze and Brass ..... 55&5%
Wrought Steel 60%
Payson's signal 80%
Reading ..... 60&10&10@70%

Machines—

Boring—Without Augers.

R. & E. Mfg. Co.: Upright. Angular.

Improved No. 3	$4.25	No. 1	$3.00
Improved No. 4	3.75	No. 2	3.38
Improved No. 5	2.75		
Jennings'	2.50		3.00
Miller Falls			5.75
Snell & Rice's Pat.	2.50		2.75
Swan's, No. 500	5.10	No. 200	6.45

Hoisting—

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist 25%

Ice Cutting—

Chandler's 15%

Washing—

Wayne American ..... ₱ doz. $28.00
Western Star, No. 2 ..... ₱ doz. 28.00
Western Star, No. 3 ..... ₱ doz 30.00
St. Louis, No. 41 ..... ₱ doz. 60.00

Mallets—

Hickory ..... 45&5@50%
Lignumvitæ ..... 45&5@50%
Tinners', Hickory and Applewood, doz. ..... 50@55c

Mats—

Door—

Elastic Steel (W. G. Co.) 10%

Mattocks—

See *Picks and Mattocks.*

Meat Cutters—

See *Cutters, Meat.*

Milk Cans—See *Cans, Milk*

Mills—Coffee—

Enterprise Mfg. Co. ..... 25@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor ..... 50&10@60
Parker's Box and Side ..... 50&10@60%
Swift, Lane Bros. 30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Net prices are generally quoted.

Cheap ..... *all sizes. $1.90@1.95*
Good ..... *all sizes, $2.25@2.50*

	10	12	14	16-inch
High Grade	4.25	4.50	4.75	5.00
Continental				60&10&5%
Great American				70&5%
Great American Ball Bearing				60&10&5%
Quaker City				70&5%
Pennsylvania				60&10&5%
Pennsylvania Golf				50%
Pennsylvania Horse				40%
Pennsylvania Pony				45%
Philadelphia:				
Styles M., S., C., K., T				70&5%
Style A, all Steel				60&10%
Style E, Low Wheel				60&10%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, low list				50&5%

Nails—

Cut and Wire. See Trade Report. Wire Nails and Brads, Papered. List July 20, 1899 ..... 85+10%
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25c	23c	22c	21c	21c	40&5%
Ausable	28c	26c	25c	24c	23c	50&10%
Capewell	19c	18c	17c	16c	16c	10&5%
C. B. K.	25c	25c	22c	21c	21c	40%
Champ'in	28c	26c	25c	24c	23c	40&10&5%
Clinton	19c	17c	16c	15c	14c	30&10&5%
Maud S.	25c	23c	22c	21c	21c	50%
Neponset	23c	21c	20c	19c	18c	40%
Putnam	23c	21c	20c	19c	18c	33⅓%
Vulcan	23c	21c	20c	19c	18c	25&10%

American, Nos. 5 to 16 ₱ lb. ..... 9@9½c
Jobbers' special brands ... per lb. 8@9c

Picture

	1½	2	2½	3	3½ in.
Brass Head	.45	.60	.70	.95	1.00 gro.
Por. Head	...	1.10	1.10	1.10	... gro.

Nippers, See *Pliers and Nippers.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain ..... $5.00@5.10
Hexagon, plain ..... $5.30@5.10
Square, C. T. & R. ..... $5.20@5.30
Hexagon, C. T. & R. ..... $5.80@5.90
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank ..... $5.20@5.30
Hexagon Blank ..... $5.80@ .90
Square Tapped ..... $5.00@5.10
Hexagon Tapped ..... $5.60@5.70

Oakum—

Best or Government ..... lb. 6¼c
Navy ..... lb. 5 c
U. S. Navy ..... lb. 5¼c
Plumbers' Spun Oakum 2¾c
In carload lots ¼c lb. off f. o. b. New York.

Oil Axle—

Snow Flake: 33⅓&10%
1 pt. cans, per doz. $3.00
1 qt. cans, per doz. $4.80
1 gal. cans, per doz. $15.00
5 gal. cans, per doz. $66.00

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper ..... 40&10@50%
Tin or Steel ..... 60&10@65%
Zinc ..... 60&10@65%
Paragon:
Brass and Copper ..... 40&10%
Tin or Steel ..... 60&10%
Zinc ..... 60&10%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Openers—Can—

French ..... doz. 35c
Iron Handle ..... doz. 25@27c
Sprague, Iron Hdle. ..per doz 35@40c
Sardine Scissors ...doz. $1.75@3.00
Tip Top ..... per doz $0.75
National, ₱ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 35@45¢
Waldorf, ₱ gro. $8.65

Egg—

Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—

Asbestos Packing, Wick and Rope, 16½@18c lb.

Rubber—

Sheet, C. I. ..... 8@12c
Sheet, C. O. S. ..... 9@15c
Sheet, C. B. S. ..... 10@14c
Sheet, Pure Gum ..... 50@70c
Sheet, Red ..... 35@40c
Jenkins' Standard, ₱ lb 80¢ ..... 25@25&5%

Miscellaneous—

American Packing ..... 7@10c lb.
Cotton Packing ..... 13@14c lb.
Italian Packing ..... 9@12c lb.
Jute ..... 3½@4c lb.
Russia Packing ..... @11c lb.

Pails—Creamery

S. S. & Co., with gauges.. No 1 $6.50; No. 2, $5.75 ₱ doz.

Galvanized—

Price per gro.

	Quart	10	12	14
Water, Regular		18 00	21.00	24.00
Water, Heavy		24.00	27.30	30 00
Fire, Rd. Bottom		31.00	33.00	35.00
Well		27.00	29.00	31.00

Pans—Dripping—

Standard List ..... 50&10@50&10%

Fry—

Common Lipped:

No.	1	2	3	4	5
Per doz.	$0.60	.75	.85	.95	1.15

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.00; 20 $5.50; 30, $6.00
Simplex, ₱ gro., No. 40 $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37.50; 160, $43.00.

Paper—Building Paper—

Asbestos:	lb.
Building Felt	3c
Mill Board, sheet, 40 x 40 inches	3c
Mill Board, roll, thicker than 1-16 inch	3c
Mill Board, roll, 1-16 in. thick and less	3c

	Per roll 500 sq. ft.
Rosin Sized Sheathing: Light wt. 20 lbs. to roll	$0.32
Medium wt., 30 lbs. to roll	$0.47
Heavy wt. 40 lbs. to roll	$0.58
Medium Grades Water Proof Sheathing	$0.65@1.25
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton	$36.00@37.00
Red Rope Roofing, 250 sq. feet per roll	$1.65

Tarred Paper.

1 ply (roll 300 sq.ft.), ton ..... $26 00@27.00
2 ply, roll 108 sq. ft. ..... @50c
3 ply, roll 108 sq. ft. ..... 6@70c
Slater's Felt (roll 500 sq. ft.) ..... 50@60c
R. R. M. Stone Surfaced coating (roll 110 sq. ft.) $2.75

Sand and Emery—

List Dec. 23, 1899 ..... 50&10@50&10@10%

Parers—Apple—

Advance	₱ doz. $4.50
Baldwin	₱ doz. $5.00
Bonanza	each $5.00
Dandy	each $7.50
Eureka, 1898	each $16.00
Family Bay State	₱ doz. $12.00
Ouds-n'-Little-Star	₱ doz. $4.00
Hudson's Rocking Table	₱ doz $5.50
Improved Bay State ₱ doz.	$27.00@30.00
New Lightning	₱ doz. $5.50
Reading 72	₱ doz. $4.00
Reading 78	₱ doz. $7.00
Turn Table '98	₱ doz. $5.50
White Mountain	₱ doz. $4.00

Potato—

Saratoga ..... ₱ doz. $5.50
White Mountain ..... ₱ doz. $4.50

Picks and Mattocks—

List Feb. 23, 1899 ..... 70@70&10%

Pigeons—Clay

Markle's Black Birds, f. o. b. factory, per m. $3.75
See also *Traps, Target.*

Pinking Irons—

See *Irons, Pinking.*

Pins—Escutcheon—

Brass 60%
Iron, list Nov. 11, '85 ..... 60%

Pipe, Cast Iron Soil—

Factory Shipments—Carload lots.
Standard, 2-6 in. ..... 65&5%
Extra Heavy, 2-6 in. ..... 70&10%
Fittings ..... 75&10&5%
NOTE.—*Freight allowed on Carload lots.*

Pipe, Merchant, Boiler Tubes, &c.—

Less than Carloads to Consumers.

Merchant Pipe.	*Black.*	*Galvanized*
⅛ to ⅜ inch	61%	48%
¼ to 10 inch	68½%	56%
Boiler Tubes	*Up to 22 feet*	
Steel.		
1 to 1¼ inch and 2¾ to 5 inch inclusive		65½%
2 to 2½ inch, inclusive		60%
6 to 10 inches		59%
Iron.		
1 to 1¼ inch and 2½ in.		43½%
1¾ to 2⅛ inch		43%
2¾ to 13 inch		53%
Casing, Cut Lengths.	*S. & S.*	
2 to 3 inch		53½%
3¼ to 4 inch		59%
4½ to 12½ inch		61½%

NOTE.—*Prices are largely nominal owing to scarcity of Pipe. Jobbers are obtaining almost any price they ask.*

Pipe, Sewer—

Standard Pipe and Fittings, 2 to 24 in.
New England 70%
New York and New Jersey 73%
Ohio and Michigan 80%
Carload lots are generally delivered.

Planes and Plane Irons—Wood Planes—

Molding ..... 40@2½@40&10%
Bench, First quality ..... 45&10@45&10&5%
Bench, Second quality ..... 50&10@50&10&5%

Bailey's (Stanley R. & L. Co)	50&10@50&10&10%
Gage Self Setting	35%

Iron Planes—

Bailey's (Stanley R. & L. Co)	50&10@50&10&10%
Chapin's Iron Planes	50&10%
Miscellaneous Planes (Stanley R. & L. Co.)	25&10@25&10&10%
Sargent's	30&10&10%

Plane Irons—

Wood Bench Plane Irons ..... 30&5@30&10&5%

Buck Bros.	30%
Stanley R. & L. Co.	50&10@50&10&10%
L. & L. J. White	20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₱ doz. $9.00

Plates—

Felloe ..... *lb 3½@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 70&10@70&5
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe .. 7 ... 8 ... 10 ... 12-in.
$1.75 $2.00 $2.75 $3.75

Acme Nippers	50@50&5%
Bernard's:	
Parallel Pliers, &c.	35%
Paragon Pliers	50&5%
Lodi Pliers	50&5%
Elm City Fence Pliers	35%
Crown Hanger Co.:	
American Button	75&10%
Cronk's	60%
Improved Button	70&10%
Stub's Pattern	50%
Combination and others	25%
Heller's Farriers' Nippers, Pincers, and Tools	50@50&5%
P., S. & W. Tinners' Cutting Nippers,	30@30&10%
Swedish Side, End and Diagonal Cutting Pliers	50%
Utica Drop Forge & Tool Co.:	
Pliers and Nippers, all kinds	40%

Plumbs and Levels—

Plumbs and Levels ..... 75@75&10%

Davis Iron, Machinist Nos. 1 to 14	20%
Davis Iron, Adjustable Nos. 6 to 40	35%
Disston's	70%
Pocket Levels	70&10&10@75&10%
Stanley R. & L. Co	70&10@70&10&10%
Stanley's Duplex	25&10@25&10&10%
Woods' Extension	33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz. No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Glaziers'—

Bulk and 1 lb. papers ..... lb. 10½c@...
½-lb. papers ..... lb. 11c @...
¼-lb. papers ..... lb. 11½c@...

Pokes, Animal—

Ft. Madison Hawkeye ..... ₱ doz. $3.25
Ft. Madison, Western ..... ₱ doz. $3.75

Police Goods—

Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans .. ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ₱ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ₱ lb 8¢
Fireside ..... ₱ gr. $2.50
Gem, ₱ gr. $4.50 ..... 10%
Japanese ..... ₱ gr. $3.50
Jet Black ..... ₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans. ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ₱ doz. $1.00
Black Silk, 5 oz. box ..... ₱ doz. $0.75
Black Silk, ½ pt. liq ..... ₱ doz. $1.00

Poppers, Corn—

Round or Square:
1 qt ..... gro. $7.00@$7.50
1½ qt ..... gro 9.50@ 10.00
2 qt ..... gro. 10.50@ 11.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—Glue—

Enameled 45%
Tinned 40%

Powder—

In Canisters:
Duck, 1 lb. each 45c
Fine Sporting, 1 lb each 75c
Rifle, ½-lb. each 15c
Rifle, 1-lb. each 25c
In Kegs:
Duck, 6¼-lb. kegs $2.25
Duck, 12½-lb. kegs $4.25
Duck, 25-lb kegs $8.00
Rifle, 6¼-lb kegs $2.25
Rifle, 12½-lb. kegs $4.25
Rifle, 25-lb. kegs $8.00
King's Semi-Smokeless:
Keg (25 lb bulk) $8.50
Half Keg (12½ lb bulk) $4.50
Quarter Keg (6¼ lb bulk) $1.90
Case 24 (1 lb cans bulk) $8.50
Half case 12 (1 lb cans bulk) $4 50

King's Smokeless:	Shot Gun	Rifle
Keg (25 lb bulk)	$12 00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17 00
Half case 12 (1 lb cans bulk)	7.25	8 75

Presses—Fruit and Jelly—

Enterprise Mfg. Co. ..... 30@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Cyclops ..... 40@40&10%
Diamond B, No. 2, ca e lots, ₱ doz. $6.00
Diamond B, No. 2, case lots, ₱ doz. $5.50
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican ₱ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 1 (large), ₱ doz. $6.50; No. 2 (large), $5.75; No 3 (small), $5.00; No. 2-B (large), $5.50; No. 3-B (small), $5.00; No. 2-D (large), $4 50; No 3-D (small) $4 00.

Pulleys—Single Wheel—

Inch	2	2½	3
Awning ..doz.	$0.45	.70	.95
Inch	2	2½	2½
Hay Fork, Swivel or Solid Eye	doz.	$1.35@1.50	
Hot House..doz	$0.65	.90	1.20
Inch	1¼	1½	1¾ 2
Screw ....doz.	$0.15	.20	.25 .30
Inch	1¾	2	2½ 2¾
Side .....doz.	$0.30	.40	.55 .60
Inch	1½	1¾	2 2½
Tackle ....doz.	$0.30	.45	.65 1.10

Stowell's:
Ceiling or End, Anti-Friction 60%
Dumb Waiter, Anti-Friction ..... 60&10%
Hay Fork, Anti-Friction, 5-in. Wheel, ₱ doz. $12.00 ..... 50%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—

Common Frame: Square or Round End per doz., 1¾ in., 15c.; 2 in., 18c
Auger Mortise, no Face Plate, per doz. 1¾ in., 12c.; 2 in., 15c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 13c.; 2 in., 15½c.

Acme.....1¾ in., 16g; 2 in., 19g
Common Sense, 1¾ in.... ₱ doz., 18c; 2 in., 20c.
Fox-All-Steel, Nos. 3 and 7, 2¼ in.....
₱ doz. 25c
No. 9, 1¾ in.....₱ doz. 20c
Extra for Plated Finish....₱ doz 20c
Extra for Anti-Friction Bronze Bushing.....₱ doz 10c
Grand Rapids All Steel Noiseless ...40%
Ideal No. 13.....1¾ in. ₱ doz.. 16c
Niagara.....1¾ in. 16c; 2 in. 19c
No. 26, Troy....1¾ in., 14½c; 2 in., 16½c
Star.....1¾ in., 16c; 2 in., 19c
Tackle Blocks—See Blocks.

Pumps—

Cistern.....60@ ...%
Pitcher Spout.....75@....%
Wood.....50@50&10%
Pump Leathers. Lower and Plunger Valves—Per gro :

Inch..	2	2¼	2½	2¾
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	3	3¼	3½	3¾	4
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list)..... 50%
Flint & Walling's Fast Mail (low list).50%
Flint & Walling's Pitcher Spout.....75%
Loud's Suction Pumps, U. S. Co.....20%
Myer's Pumps, low list 50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....30%

Punches—

Revolving (4 tubes)...doz. $3.75@4.25
Saddlers' or Drive, good..doz. 65 @70c
Spring, single tube, good quality... $1.65@1 75
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....50%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.....
35@33&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....60%

Rail— Barn Door, &c.—

Cast Iron, Barn Door: Flange Screw Holes for Rd. Groove Wheels :

½	⅝	¾	In.
$1.70	*$2.10*	*$3.00*	*100 feet.*

Angular for Sq. Groove Wheels :

Small.	*Med.*	*Large.*	
$1.60	*1.95*	*2.70*	*100 feet.*

Sliding Door, Brnzed Wr't iron, fl, 6½c
Sliding Door, Iron Painted....2½@3c
Sliding Door, Wrought Brass, 1 in.... lb. 36c.50%
Cronk's Double Braced Steel Rail, ₱ foot.....3½c
Cronk's O. N. T. Rail.....3½c
Lanes' O. N. T., ₱ 100 ft., 1 inch....$2.85
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.' .....₱ ft. 4½c
McKinney's None Better.....₱ ft. 3½c
McKinney's Standard.....₱ ft. 4 c
Stowell's Cast Rail.....1½c
Stowell's Steel Rail, Plain.....2½
Stowell's Wrought Bracket, Plain....3½c

Rakes—

Net Prices, Malleable Rakes :

	10	*12*	*14*	*16-tooth*
Shank.....	*$1.50*	*1.60*	*1.75*	*1.85*
Socket....	*$1.65*	*1.80*	*1.95*	*2.10*

Sept. 1, 1900, List :
Cast Steel.....70c&5c&2%
Malleable.....70c&10@75c&5%
Lawn Rakes, Metal Head, per doz..
20 teeth.....*$3.25@3.50*
24 teeth.....*$3.60@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3 00
Jackson Lawn, 20 and 30 teeth.....
₱ doz. $4.00
Kohler's :
Lawn Queen, 20-tooth, ₱ doz.....$3.60
Lawn Queen, 24-tooth, ₱ doz. ..$4.75
Paragon, 20-tooth, ₱ doz 2.85
Paragon, 24-tooth, ₱ doz.....3.00
Steel Garden, 14-tooth, ₱ doz.....$3.00
Malleable Garden, 14-tooth ₱ doz. $2.25

Rasps, Horse—

Disston's.....75%
Heller Bros.....70&5%
McCaffrey File Co Horse Rasps.60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razors—

Boracle.....70%
Fox Razors, No. 42... ₱ doz. $10.00
Fox Razors, No. 44.. ₱ doz $8.00
Fox Razors, No. 82, Platina, ₱ doz $24.00 } dis. 40%
Silberstein:
Carbo Magnetic.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 99.....$12.00
All other Razors.....40%
Safety Razors.....40%

Razor Strops—

See *Strops, Razor.*

Reels— Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 43 and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%
Shakespeare, Style C.....25%

Registers—

List Sept. 2, 1901.

Black Jap.....
White Jap.....
Bronzed.....
Nickel Plated.....
Electro Plated.....
} 6c@10c&5 @7c&5%

There is a good deal of irregularity in prices of Registers, especially in Black Japanned, and some jobbers and manufacturers are using the old list.

Revolvers—

Single Action.....80@85c
Double Action.....*1 30*
Automatic.....*$2.75*
Hammerless.....*$3.25*

Riddles, Grain or Sand—

16 in. per doz.....*$2.00@$2.25*
17 in. per doz.....*$2.25 @$2.50*
18 in. per doz.....*$2.50@$2 75*

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 Inch.*
Steel..	*.....$0 80*	*0.90*	*0.9o doz.*
Copper.	*..... 1.10*	*1.80*	*1.50 doz.*

Hog Rings and Ringers—

Hill's Rings....gro. boxes, $4.00@4.50
Hill's Ringers, Gray Iron. doz. 50@55c
Hill's Ringers, Mal. Iron, doz. 75@80c
Blair's Rings.....per gro. $5.75@6.00
Blair's Ringers...per doz. $0.65@ .70
Brown's Rings...per gro. $6.00@6.25
Brown's Ringers..per doz. $1.00@1.10
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $3.50

Rivets and Burrs—

Copper.....50@50&5%
Iron or Steel :
Tinners'.....70@70&10%
Miscellaneous.....70@70&10%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....50&10&10%
Cronk's Stay.....6⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's, Stay.....33⅓%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger lb. 12¼@13 c
Manila.....¾-inch .....lb. 13¼@13½c
Manila ¼ & 5-16 in.....lb. 13¼@14 c
Manila, Tarred Rope, 15 thread.....lb 12¾@13 c
Manila Hay Rope. Medium.....lb. 12¾@13 c
Sisal, 7-16 in. and larger lb. 8¾@ 9 c
Sisal.....¾-inch..lb. 9¼@ 9½c
Sisal ¼ and 5-16 in....lb. 9¾@10 c
Sisal, Hay Rope, 2 to 10 ply.....lb. 9 @ 9¼c
Sisal, Tarred, Medium Lath Yarn.....lb. 8½@ 8¾c
Cotton Rope :
Best.....¼-in. and larger lb. 13½c
Medium...¼-in. and larger lb. 11 c
Com.....¼-in. and larger lb. 9 c
Jute Rope :
Thread No. 1, ¼ in. and up lb. 6½c
Thread No. 2, ¼-in. and up lb. 6 c
Yarn, ¼ in and up..... lb. 5 c

Wire Rope—

Galvanized.....25c&7½&5%
Plain.....50c&7½&5%

Ropes, Hammock—

Covert Mf'g. Co.....45&2%
Covert Saddlery Works.....60&5%

Rules—

Boxwood.....75c&10c&10c&10@75c&10c&10c&1½&5%
Ivory.....35c&10c&10@35c&10c&10c&5%
Chapin-Stephens Co.:
Boxwood.....75&10&10@75&10&10&10%
Ivory.....35&10@35&10&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Stanley R. & L. Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory.....35&10@35&10&10%
Upson Nut Co.:
Boxwood...75&10&10@75&10&10&10%
Ivory.....35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers Sausage.*

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Circular.....50&50&10%
Band.....50&10&10%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Disston's :
Circular Solid and Inserted Tooth.50%
Band 2 to 14 in. wide.....60%
Band ¼ to 1¾.....70%
Crosscuts.....4"@45&10%
Narrow Crosscuts.....50@50&10%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....37½@37½&7½%
Woodsaw Blades.....40@40&7½%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 0, 16, 4100, D8, 120, 79, 77, 8.....25@25&7½%
Hand Saws, Nos. 7, 107, 10, 3, 1, 0, 00, Combination.....30@30&7½%
Compass, Keyhole, &c.....25@25&7½%
Butcher Saws and Blades..35@35&7½%
C. E. Jennings & Co.'s :
Back Saws.....25%
Butcher Saws.....35%
Compass and Key Hole Saws.....25%
Framed Wood Saws.....40%
Hand Saws.....25@30%
Wood Saw Blades.....45%
Peace :
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson :
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds' :
Circular Saws.....50%
Crescent Ground Cross Cut Saws.35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Compass, Keyhole, &c .....25@25&7½%
Wood Saws .....35@35&7½%

Hack Saws—

Disston:
Concave Blades.....35%
Keystone.....30%
Hack Saw Frames.....30%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, 330.....40%
Hack Saws, Nos. 175, 180, 330, complete.....40%
Griffin's Hack Saw Frames 45%
Griffin's Hack Saw Blades.....45%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18: with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete $4.00.....15&10%

Scale Beams—

See *Beams, Scale.*

Scales—

Family, Turnbull's.....50@50&10%
Counter :
Hatch, Platform, ¼ oz to 4 lbs. doz $5.50
Two Platforms, ¼ oz to 8 lbs. doz. $16
Union Platform, Plain...$1.70@1.90
Union Platform, Striped $1.85@2 15
Chatillon's :
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Confectionery, Postal, Ice, &c.....
"The Standard" Portables.....40%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle.....doz $2.25@2.50
Box, 2 Handle.....doz. $3.75@4.00
Ship, No 1, doz. $3.50; No 2, $2.25@2.50
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%

Screens, Window, and Frames—

Bonanza Window Screens....60&60&5%
Fiver Pattern Window Screen.60&60&5%
Maine Window Screen Frames 40&10&5%
Perfection Window Screens.....60&60&5%
Phillips' Window Screen Frames.....60&10&5%
Porter's Hummer Window Screens.....60&10&5%
Porter's Klondike Window Screens .....40&2½@60&7½%
Wabash Spring Adj. Screen.....50%
See also *Doors.*

Screw Drivers—

See *Drivers, Screw.*

Screws—Bench and Hand—

Bench, Iron..doz. 1 in., $3.00@3.25 ; 1¼, $3.50@3.75 ; 1¼, $4.00@4.50
Bench, Wood, Beech..doz. $2.50@2.75
Hand, Wood.....30&5@40%
Hand, R. Bliss Mfg. Co.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....75c&5@...%
Coach and Lag, Gimlet Point, list Oct. 1, '99.....75@...%
Hand Rail, list Jan. 1, '81.60c@10@...%

Jack Screws—

Standard, List.....75@75&10%
Millers Falls.....50&10&10%
Millers Falls, Roller .....50&10%
P., S. & W.....50&50&5%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50@50&10%
Flat or Round Head, Brass50@50&10%

Set and Cap—

Set (Iron or Steel).....70c&10c&10%
Sq. Hd. Cap.....65c&10c&10%
Hex. Hd, Cap.....65 &10c&10%
Rd. or Fillister Hd. Cap...60 &10c&10%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts :
Flat Head, Iron.....87½@90%
Round Head, Iron.....85@87½%
Flat Head, Brass.....85@87½%
Round Head, Brass.....82½@85%
Flat Head, Bronze.....75@80%
Round Head, Bronze.....72½@77½%
Drive Screws.....87½@90%
NOTE.—*Extra 5&10% often given.*

Scroll Saws—See *Saws, Scroll.*

Scythes—

Per doz.
Clipper Pattern, Grass.....*$5.25*
Full Polished Clipper.....*$5.75*
Grain.....*$7.00*
Clipper, Grain.....*$7.50*
Wood and Bush.....*$4.50*

Scythe Snaths—

See *Snaths, Scythe.*

Seeders— Raisin—

Enterprise.....25&30%

Sets— Awl and Tool—

Brad Awl and Tool Sets :
Wood Hdle., 10 Awls doz. $2.00@2 25
Wood Hdle., 14 Awls, 6 Tools, doz. $2.50@2.60
Aiken's Sets, Awl and Tools :
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool Hdls. Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool Hdls, No. 1, $12; No. 4, $12; No. 5, $18 .... 15&10%
Stanley's Excelsior :
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&10@30&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.....
₱ doz.....$9.00

Nail—

Square.....*per gro. $2 50*
Round, Blk. and Pol., assorted. gro. $1.80@2.50
Octagon.....*gro. $4.25@4.75*
Knurled, Good.....*gro. $5.00@5.50*
Buck Brothers.....27½%
Cannon's Diamond Point, ₱ gr. $12..25%
Mayhew's.....per gro. $9.00
Snell's Corrugated, Cup Pt.....per gro, $7.50
Snell's Knurled, Cup Pt.....per gro $7.50

Rivet—

Regular list.....70@70c10c&5%

Saw—

Aiken's:
Genuine.....₱ doz. $5.50@6.00
Imitation .....₱ doz. $3.00@3.10
Atkin's :
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....20%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $23...50&20&5%
No. 5, Mill, $31.00.....50& 0& 0%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Taintor Positive, ₱ doz. $18 .....60%

Sharpeners Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co .....70&5%
Tanite Mills ₱ gross, $14.40...25@33⅓%

Sharpeners Skate—

Eureka Skate Sharpener.....₱ doz. $2.00

Shaves, Spoke—

Iron.....*doz. $1 00@1 25*
Wood.....*doz. $1.75@2.00*
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00.....15&10%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best	*$16.00*	*18.00*	*20.00 gro.*
Good.....	*$13.00*	*15.00*	*17 00 gro.*
Cheap.....	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70c10%
" Nickel.....60@60c10%
Fair qual. Jap.....80@80c5%
" Nickel.....75@75c10%
Tailors' Shears.....40@40c10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....1000 list. 50%

Tinners' Snips—

Steel Blades.....20c&10%
Steel Laid Blades.....40c&10%
Forged Handles, Steel Blades, Berlin.....40@10&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch.....50%
Niagara Snips.....40%
P. S. & W. Co.....20%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00.....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00 .....25@25&10%
John T. Henry Mfg. Company :
Pruning Shears, all grades..40@40&5%
Orange Shears.....50&10@50&20%
Grape.....40&10@50%
Tree Pruners.....75%
Nagley's Pruning Shears.....10&5%
P., S. & W. Co.....33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list, 75&10&10%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville, Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&10&5&10%

Shells— Shells, Empty—

Brass Shells, Empty :
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.. 65&5%
Paper Shells, Empty :
Acme, Ideal, Leader, New Rapid, 8 nokeless, 10, 12, 16 and 20 gauge, 33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge.....15%
Climax Club, League, Rival, 14, 16 and 20 gauge ($7.50 list).....20&5%
Climax Club, League, Rival 10 and 12 gauge.....25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12 16 and 20 gauge.....15%
Trapshot Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder.....40c&5%
Loaded with Smokeless Powder, medium grade.....40c10c&5%
Loaded with Smokeless Powder, high grade.....40c10c10c&5%

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg.
Iron.....*per keg $3.50*
Steel.....*per keg 3.25*
Barden's, all sizes, ₱ keg.....$3.60

Shot—

Drop, up to B, 25-lb. bag.....*$1.50*
Drop, B and larger, per 25-lb. bag...
$1.75
Buck, 25 lb. bag.....*$1.75*
Chilled, 25 lb. bag.....*$1.75*
Dust Shot, 25-lb. bag.....*$2.00*
Markle's Chilled.....$1.75
Raymond Chilled.....$1.75
Tatham's Chilled.....$1.75

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle :

	A1, *1st Grade.*	*B2,* *2d Grade*
Plain Back....	*$10 50*	*$9 60*
Strap Back....	*9.90*	*9.00*
Cleveland Pat'n	*10.20*	*9.30*

	C3, *3d Grade.*	*D4,* *4th Grade*
Plain Back....	*$8.70*	*$8.10*
Strap Back....	*8.10*	*7.50*
Cleveland Pat'n	*8.40*	*7.80*

All other sizes add 30c doz.
Black deduct 30c doz.

Note.—The above are the regular Association prices but are often shaded by

Jobbers $0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at about $4.00.

Sieves and Sifters—

Hunter's Imitation, gro. $11.00@11.50
Buffalo Metallic Blued, S. S. & Co., ₱ gr.:

14&16	16&18	18&20
$12.90	$13.80	$15.00

F. J. Meyers' Mfg. Co.:
Eclipse, ₱ gr. $11.00
Electric Light, ₱ gr. $11.00
Hunter's Genuine, ₱ gr. $12.50
No Name, Hunter's, ₱ gr. $11.00
Standard, ₱ gr. $11.00
Shaker (Barler's Pat.) Flour Sifters, ₱ doz., $2.00 ..... 90%

Sieves, Tin Rim—

Per dozen

Mesh	14	16	18	20
Black, full size	$0.95	.98	1.00	1.10
Plated, full size	$1.05	1.08	1.10	1.20
Black, scant		$0.78	.80	.83

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz. ..... $0.65@0.75
Mesh 20, Nested, doz. ..... .75@ .85
Mesh 24, Nested, doz ..... .90@1.00

Sinks—

Cast Iron—

Standard list ..... 65&10@70&10%
NOTE.—*There is not entire uniformity lists used by jobbers.*

Wrought Steel—

New Era, Galv'd and Enameled... 70&5%
New Era, Painted ..... 50&10%
L. & G. Mfg. Co., Galvanized 50%
L. & G. Mfg. Co. Enameled 50%

Skeins, Wagon—

Cast Iron ..... 70&10@75%
Malleable Iron ..... 40&10@50%
Steel ..... 50@40&10%

Slates—

Factory Shipments.
"D" Slates ..... 50&10&10&10%
Unexcelled, etc., Noiseless Slates .60 & 8 tens %
Victoria, etc., Noiseless Slates .60& 7 tens %
Wire Bound ..... 50&10&5%
Web Hinge 5%

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling ₱ 2.00 ..... 33⅓

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Deroy ..... 35&2%
High Grade ..... 45&2%
Jockey ..... 40&2%
Trojan ..... 40&2%
Yankee ..... 30&2%
Yankee, Roller ..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
W. & B. Mfg. Co.:
Bristol ..... 40&10%
Empire ..... 50&5%
German 40%
National ..... 50&5%
Perfect 40%
Clipper ..... 50&5%
Champion 40%
Security 40%
Victor ..... 60&5%
Oneida Community:
Solid Steel ..... 45@65& 0%
Solid Swivel ..... 65&10@65&10&10%
Sargent's Patent Guarded ..... 66⅔&10%

Snaths—

Scythe ..... 45&5&2%

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Good Quality ..... 50&10@60&10&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 45&10%
Rogers & Bro., William Rogers Large Brand ..... 50&10%
Ancasor, Rogers Brand 60%
Wm. Rogers & Son ..... 60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware 60%
No. 77 Silver Plated Ware ..... 60&10%

Miscellaneous—

German Silver ..... 60&10@70&10&10%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list ..... 1 &10%

Tinned Iron—

Teas ..... *per gro.* 45@54c
Tables ..... *per gro.* 90c@$1.00

Springs—

Door—

Gem (Coil) 20%
Star (Coil) 30%
Torrer's Rod, 30 in. ..... ₱ doz. $1.10@1.25
Victor (Coil) ..... 50&10&10%

Carriage, Wagon, &c.

1¼ in. and Wider:
Black or ⅛ Bright, lb 5c
Bright, lb 5½c
Painted Seat Springs:
1½ x 2 x 26 and smaller, per pr 45@48c
1½ x 2 x 28 per pr ..... 52½@56c
1½ x 3 x 28 and narrower, per pr. ..... 70@75c

Sprinklers, Lawn—

Enterprise ..... 35@20%
Philadelphia No. 1, ₱ doz. $12; No. 2, $15; No. 3, $24 ..... 30%

Squares—

Nickel plated ..... } *List Jan. 5, 1900*
Steel and Iron ..... } 70&10@75%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels. ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels ..... 60&10%
Winterbottom's Try and Miter ..... 50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz.* $2.50@2.75
Good Grade ..... *doz.* $3.00@3.50
Tinned Iron ..... *doz.* $0.75@1.25
Iron, Porcelain Lined doz. $2.90@3.25
Jennings' Star ..... ₱ doz. $1.85@1.90

Staples—

Barbed Blind ..... *lb.* 7@7¼c
Electricians', Association list ..... 80&10&10&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting, Staples ..... *per lb.* 2¼@2½c
Grand Crossing Tack Co.'s list ..... 80&10%

Steels, Butchers'—

Dick's 20%
Foster Bros' 30%
Hartzell Cutlery Co ..... 40&5%
C. & A. Hoffmann's 40%

Steelyards ..... 25@25&10%

Stocks and Dies—

Blacksmiths' ..... 40@40&10%
Gardner Die Stocks No. 1 ..... 50%
Gardner Die Stocks, larger sizes 40%
Green River 25%
Lightning Screw Plate 25%
Little Giant 25%
Reece's New Screw Plates ..... 25&30%
Curtis Reversible Ratchet Die Stock 25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, [illegible] inch, $3.00 per gro., 12 inch, $10.
Pike Mfg. Co. 1901 list:
Black Diamond S. S. ₱ gro. $12.00
Lamoille S. S. ₱ gro. $11.00
White Mountain S. S. ₱ gro. $9.00
Green Mountain S. S. ₱ gro. $6.00
Extra Indian Pond S. S. ₱ gro. $7.50
No. 1 Indian Pond S. S. ₱ gro. $7.00
No. 2 Indian Pond S. S. ₱ gro. $4.50
Leader Bevel End S. S. ₱ gro $4.50
Balance of Pike list 33⅓%

Oil Stones, &c.

Chicago Wheel & Mfg. Co. 1901 list:
Gem Corundum Oil, Double Grit 50%
Gem Corundum Axe, Single or Double Grit 55%
Gem Corundum Slips 55%
Gem Corundum Razor Hones 50%
Pike Mfg. Co. 1901 list: ₱ lb
Arkansas Stone, No. 1, 3 to 5 in. $2.80
Arkansas Stone, No. 1, 5 to 8 in. $3.50
Arkansas Slips No. 1 ..... $4.00
Lily White Washita 4 to 8 in ..... 60¢
Rosy Red Washita, 4 to 8 in ..... 40¢
Washita Stone, Extra, 4 to 8 in.. 50¢
Washita Stone, No. 1, 4 to 8 in.. 40¢
Washita Stone, No. 2, 4 to 8 in. 30¢
Lily White Slips ..... 90¢
Rosy Red Slips ..... 90¢
Washita Slips, Extra ..... 80¢
Washita Slips, No. 1 ..... 70¢
India Oil Stones (entire list) 25%
Hindostan No. 1, Regular ..... ₱ lb 8¢
Hindostan No. 1 Small ..... ₱ lb 10¢
Axe Stones (all kinds) 33⅓%
Turkey Oil Stones, ex. 5 to 8 in. ₱ lb 8¢
Queer Creek Stones, 4 to 8 in ..... 30¢
Queer Creek Slips ..... 0¢
Sand Stone ..... 5¢
Belgian, German and Swaty Razor Hones 40%
Natural Grit Carving Knife Hones, ₱ doz. $3.00
Quick Edge Pocket Knife Hones, ₱ doz. $2.00
Mounted Kitchen Sand Stone, ₱ doz. $1.50
Tanite Mills:
Emery Oil, ₱ doz. $5.00 ..... 50@60%

Stoners—

Cherry—

Enterprise ..... 25@30%

Stops, Bench—

Millers Falls ..... 15&10%
Morrill's ..... ₱ doz., No. 1, $10.00.. 50& 0%
Morrill's, No. 2, $11.00 ..... 50&10%

Stops, Window—

Ives' Pattern ..... 25&5%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers, Pump—

Diamond Joe Pump Strainers, per doz. ¢

Straps, Box—

Cary's Universal case lots ..... 20&10%

Stretchers, Carpet—

Cast Iron, Steel Points ..*doz. 55@65c*
Socket ..... *doz. $1.75*

Strops, Razor—

Smith & Hemenway Co 70%

Stuffers, Sausage—

Enterprise Mfg. Co. ..... 25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97 ..... 30%

Tacks Brads, &c.—

List Jan. 15, '99.

Carpet Tacks, American 90¢25@....%
American Cut Tacks ..90¢20@....%
Swedes Iron Tacks ..90¢ 0@....%
Swedes Upholsterers' Tacks ..... 90¢40@....%
Gimp Tacks ..... 90¢ 0@....%
Lace Tacks ..... 90¢40@....%
Trimmers' Tacks ..... 90¢25@....%
Looking Glass Tacks ..... 70¢10%
Bill Posters' and Railroad Tack ..... 90¢40@....%
Hungarian Nails ..... 80¢15%
Common and Patent Brads ..... 80¢10%
Trunk and Clout Nails ..... 80¢5%

NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10&2½% on Standard Weights.****

Miscellaneous—

Double Point Tacks ..... 90¢&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list ..... 50¢10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co. 30-gal., $3.20
Emerald, S. S. & Co. 60-gal., $4.00
Queen City S. S. & Co., 50-gal. $3.50
Queen City S. S. & Co., 60-gal. $4.25

Tapes, Measuring—

American Asses' Skin ..... 40¢10@50%
Patent Leather ..... 25@30¢5%
Steel ..... 10@40¢5%
Chesterman's ..... 25@25¢5%
Eddy's Steel ..... 40@40&5%
Eddy's Metallic ..... 33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899 ..... 33⅓
Lufkin's Steel ..... 33⅓@33⅓%
Lufkin's Metallic ..... 30@30&5%

Teeth Harrow—

Steel Harrow Teeth, plain or headed, bas per lb 2¼c

Thermometers—

Tin Case ..... 80¢10@80¢10¢5%

Ties, Bale—Steel.

Standard Wire ..... 50¢10¢5%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5 32 x 6½ in. ₱ 1000, $10.00
Galv. Steel 5 32 x 8½ in. ₱ 1000, $11.00
Galv. Steel 5 32 x 11½ in. ₱ 1000 $12.00
Galv. Steel 5 32 x 15½ in. ₱ 1000 $14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White ..... 20@20&5%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme ..... *doz. $1.15@1.25; gro. $10.50@11.00*
Harper, Champion or Paragon ..... *doz. $1.25@1.50; gro. $12.00@12.50*

Game—

Oneida Pattern ..... 75¢10¢5@80¢5%
Newhouse ..... 45@45&5%
Hawley & Norton ..... 65&5@65&10%
Victor (Oneida Pattern) ..... 75@75&5%
Star (Blake Pattern) ..... 65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes ..... 8½@9c
Mouse, Round or Square Wire ..... *doz. $0.85@1.00*
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₱ doz. $4.50; in ⅛ gro. lots, ₱ doz. $4.00
No. 2, Detroit Marty Pattern, ₱ doz. $3.25; in ⅛ gro. lots, ₱ doz. $3.00
Detroit Marty Pattern Mouse, ₱ doz. $2.00; in ⅛ gro. lots, ₱ doz. $1.75
Diamond Joe Mouse Traps ..... per doz. 60¢
Diamond Joe Rat Traps ..... per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₱ doz. $12.00
No. 3, Rat, ₱ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₱ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₱ doz. $3.50; case of 72 $4.75 doz.
No. 5, Mouse, ₱ doz $2.75; case of 150 $2.25
Schuyler's Rat Killer, No. 1, ₱ gr. $30.00; No. 2, ₱ gr. $20.00; Mouse, No. 3, $18.00 ..... 5%

Target—

Markle's, each $5.50

Trimmers, Spoke—

Bonney's Nos. 1 and 2 ..... 40%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 40%
Never-Break Steel Garden Trowels, gro. $7.00
Peace's Plastering 30%
Rose Brick and Plastering ..... 25&5%
Woodrough & McParlin, Plaster'ing 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list 50%
Daisy Stove Trucks, Improved pattern ₱ doz. $18.50
Model Stove Trucks ..... ₱ doz $18.50

Tubs, Wash—

	No. 1	*2*	*3*
Galvanized, per doz.	*$5.00*	*5.50*	*6.00*
Galvanized Wash Tubs (S. S. & Co.):			
No. 1	2	3	
Per doz.	$5.25	6.00	6.75
	10	20	30
	6.50	7.25	8.00

Twine—

Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*22c*	*24c*
No. 12, ¼ and ½-lb. balls	*18c*	*20c*
No. 18, ¼ and ½-lb. Balls	*16c*	*18c*
No. 24, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 36, ¼ and ½-lb. Balls	*15c*	*17c*
Chalk Line, Cotton, ½-lb Balls		*22@22½c*
Cotton Mops, 6, 9, 12 and 15 lb., to doz		*70@80*
Cotton Wrapping, 5 Balls to lb according to quality		*10 - 60c*
American 2-Ply Hemp, ¼ and ½-lb. Balls		*12@13c*
American 3 Ply Hemp, 1-lb. Balls		*12@13c*
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)		*8½c*
India 2-Ply Hemp, 1-lb. Balls		*8½c*
India 3-Ply Hemp, 1¼-lb. Balls		*7c*
2, 3, 4 and 5-Ply Jute, ½-lb. Balls		*9½@10c*
Mason Line, Linen, ½-lb. Balls		*15c*
No. 264 Mattress, ¼ and ½-lb. Balls		*37c*
Wool, 3 to 6 ply		*5¾c*

Vises—

Solid Box ..... 50@50&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Bonney's 40%
Fisher & Norris Double Screw ..... 15&10%
Hollands':
Machinists' 40%
Key-tone ..... 65&5%
Lewis Tool Co ..... 20@30%
Massey's Perfect ..... 15@20%
Massey's:
Clincher ..... 80@40%
Combination, Quick Adj. 40%
Woodworker's ..... 15@20%
Merrill's 20%
Miller's Falls ..... 50&10&10%
Parker's:
Victor ..... 20&25%
Regulars ..... 20@25%
Vulcan's ..... 40@45%
Combination Pipe ..... 55@60%
Prentiss ..... 20@25%
Sargent's 40%
Snedliker's X. L. ..... 20@25%
Stephens' ..... 20@25%
Columbian Hdw Co 40%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16 ..... 50%
Disston's D 3 Clamp and Guide, ₱ doz $30 ..... 25%
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 ..... 45&50%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60%
Parker's Combination Pipe:
87 Series 60%
187 Series ..... 60&5%
No. 870 ..... 40%

Wads—Price Per M.

B. E., 11 up	*60c*
B. E., 9 and 10	*70c*
B. E., 8	*80c*
B. E., 7	*80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*
Ely's B. E., 11 and larger	*$1.00@1.75*
Ely's P. E., 12 to 20	*$3.00@3.25*

Dis. 20&2½%

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—

S. S. & Co. Reduced List 40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground 65%
Unground 70%
White Enameled Ware:
Maslin Kettles ..... 75¢@16¢5@80%
Covered Ware:
Tinned and Turned ..... 40¢10@10&10¢5%
Enameled and Plain ..... 50@50¢10¢5%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list July '99 ..... 33⅓&10%
L. & G. Opal Enameled Ware 65%
Iron Clad Ware ..... 70&10%
Never Break Enameled ..... 50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	6	7	8	9
Each	45c	50c	55c	65c

Steel Hollow Ware.

Avery Spiders & Griddles ..... 65@65&5%
Avery Kettles 60%
Porcelained ..... 50&5@50&10%
Never Break Spiders and Griddles ..... 65&5%
Never Break Kettles 60%
Solid Steel Spiders & Griddles ..... 65&5%
Solid Steel Kettles 60%
Solid Steel Ware, Enameled ..... 50&5%

Washboards—

Solid Zinc:	₱ doz
Crescent, family size, bent frame	$3.00
Red Star, family size, stationary protector	$3.00
Double Zinc Surface:	
Saginaw Globe, family size, stationary protector	$2.65
Cable Cross, family size, stationary protector	$2.40
Single Zinc Surface:	
Naiad, family size, open back perforated	$2.40
Saginaw lobe, protector, family size, ventilated back	$2.25

Brass Surface:
Brass King, Single Surface, open back $3.00
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.00

Washers—
Leather, Axle—
Solid.....85&10@10@85&10&10@10%
Patent.....85&10@85&20%
Coil: ¾ 1 1¼ 1¾ *Inch.*
10c 11c 14c 18c *per 100*

Iron or Steel
Size bolt ... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.10 4.00 2.70 2.00 2.50
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.

Cast Washers—
Over ½ inch, barrel lots, per lb...... 1½@1¾c

Washer Cutters—
See Cutters, Washer.

Washing Machines—
See Machines, Washing.

Water Coolers—
See Coolers, Water.

Wedges—
Oil Finish.....lb. 2.90@3.10c

Weights, Sash
Per ton, f.o.b. factory....$19.00@22.50

Some Foundries make price $1@$2 lower

Well Buckets, Galvanized
See Pails, Galvanized.

Wheels Well—
8-in., $1.50@1.75; 10-in., $1.80@2.10; 12-in., $2.25@2.75; 14-in., $3.75@4.65

Wire and Wire Goods—
Bright and Annealed:
6 to 9 .....72½&5@72½&10%
10 to 18.....72½&10@72½&10&5%
19 to 26.....75&10&2½@75&10&2½%
27 to 36 .....75&10&2½@75&10&2½%
Galvanized:
6 to 18 .....70@70&5%
19 to 26 .....75&5@72½&10%
27 to 36.....72½&10@72½&10&5%
Copper:
6 to 9.....70&5@70&10%
10 to 18.....70&10@70&10&5%
19 to 26.....75&10@75&10&2½%
27 to 36.....75&10@75&10&5%
Tinned:
6 to 14.....75@75&7½%
15 to 18.....72½&5@72½%
19 to 26.....70&5@70&5&5%
27 to 36.....70@70&5%
Annealed Wire on Spools..70&5@70&10%
Brass and Copper Wire on Spools.. 60&5@50&10%
Brass, list Feb. 26, '96.....25%
Copper, list Nov. 26, '95.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire .....$3.60 to £. 40%
Wire Clothes Line, *see Lines.*
Wire Picture Cord, *see Cord.*

Bright Wire Goods—
List April 1, 1901.....85&10@...%

Wire Cloth and Netting—
Galvanized Wire Netting..80&20@...%
Painted Screen Cloth per 100 ft.... $1.40@1.10
Light Hardware Grade:
2-18 Mesh, Plain (8c. list) *sq. ft.*.. 1¼@1¾c
2-18 Mesh, Galv. (8c. list) *sq. ft.*... 2¼@2¾c

Wire, Barb—*See Trade Report.*
Wire Rope—*See Rope, Wire.*
Wrenches—
Agricultural.....70&10@75&10%
Case lots .....75&10%
Acme .....60&10%
Alligator 70%
Baxter's S.....60&10%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable S Pipe.....10%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....55%
Extra Heavy.....45%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Bridley Automatic.....30%
Boardman's.....33⅓%
Coes' Genuine.....40&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....50&10%
Elgin Wrenches.....40%
Elgin Monkey Wrench Pipe Jaws...33⅓%
Gem Pocket 30%
Hercules.....70%
Knife Handle, Machinists' (W. & B.):
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....%
Solid Handles, P.S. & W.....50@50&10%
Triumph.....60&10%

Wrought Goods—
Staples, Hooks, &c., list March 17 '92.....70@90&10%

Yokes Neck—
Covert Saddlery Works, Trimmed.60&5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—
Fort Madison's Farmers & Freighters'.. list net

Zinc—
Sheet.....lb 6¼c@6¾c

PAINTS, OILS AND COLORS—Wholesale Prices.

White Lead, Zinc, &c.
Lead, Engl sh white, in Oil.. .. @ 9¼
Lead, American White, in Oil:
Lots of 500 ℔ or over ..... @ 6½
Lots less than 500 ℔..... @ 7
Lead, White, in oil, 25 ℔ tin pails, add to keg price..... @ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price ..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.. .. @ 1¼
Lead White, Dry in bbls..... 5½@ 6
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....℔ ℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry ..... @ 8½
Zinc, Paris, Green Seal, dry..... @ 9¼
Zinc, Antwerp Red Seal, dry... .. @ 6½
Zinc, Antwerp, Green seal, dry .. @ 8
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¼
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11@11½
Discounts.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.
Black, Carbon.....℔ ℔ 8 @20
Black, Drop, Amer..... 4 @ 7
Black, Drop, Eng..... 7 @11
Black, Ivory .....12 @21
Lamp, Com..... 4½@ 6
Blue, Celestial.....℔ ℔ 4 @ 6
Blue, Chinese.....30 @35
Blue, Prussian.....28 @34
Blue, Ultramarine..... 4 @20
Brown, Spanish..... 1@ 1
Brown, Vandyke, Amer..... 1¾@ 2¼
Brown, Vandyke, Foreign..... 2½@ 3½
Carmine, No. 40.....℔ ℔ $2.05@2.75
Green, Chrome, ordinary..... 5 @ 6½
Green, Chrome, pure.....16 @20
Lead, ited, bols. ½ bols. and kegs:
Lots 500 ℔ or over..... @ 6
Lots less than 500 ℔..... @ 6¼
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... @ 6
Lots less than 500 ℔..... @ 6½
Ocher, French Washed..... 1½@ 1¾
Ocher, Dutch Washed..... 4½@ 5
Ocher, American ... ℔ ton $10.00@15.00
Orange Mineral, English.. ℔ ℔ 8 @11½
Orange Mineral, French.....11 @11½
Orange Mineral, German..... 8 @10¾
Orange Mineral, American .... 8 @ 8½
Red, Indian, English..... 4½@ 8½
Red, Indian, American ..... 3 @ 3½
Red, Turkey, English..... 4 @ 6
Red, Tuscan, English..... 7 @10
Red, Venetian, Amer., ℔ 100 ℔. 80@1.75
Red Venetian, English, ℔ 100 ℔ 1.80@3.00
Sienna, Italian, Burnt and Powdered.....℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd..... 3½@ 7½
Sienna, American, Raw..... 1½@ 2
Sienna, American, Burnt and Powdered.....℔ ℔ 1½@ 2
Talc, French.....℔ 100 ℔ $1.25@1.50
Talc, American ..... .90 @1.10
Terra Alba, French, ℔ 100 ℔ . 95 @1.00
Terra Alba, English..... .95 @1.00
Terra Alba, American No. 1.....85 @85
Terra Alba, American No. 2.....45 @50
Umber, Turkey, Bnt. & Pow.℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer..... 1½@ 2
Umber, Raw, Amer..... 1½@ 2
Yellow, Chrome .....10½@25
Vermilion, American Lead.....10 @40
Vermilion, Quicksilver, bulk .. @70
Vermilion, Quicksilver, bags.... @71
Vermilion, English, Import.. .80 @95
Vermilion Chinese.... .$1.05@1.20

Colors in Oil.
Black, Lampblack..... 12 @14
Blue, Chinese..... .36 @40
Blue, Prussian.....32 @35
Blue, Ultramarine.....13 @16
Brown, Vandyke..... 9½@13
Green, Chrome.....10 @12
Green, Paris..... @21
Sienna, Raw..... .10 @13
Sienna, Burnt.....10 @13
Umber, Raw..... 9½@12
Umber, Burnt..... 9½@12

Miscellaneous.
Barytes, Foreign, ℔ ton....$19.00@21.00
Barytes, Amer. floated..... 19.00@20.00
Barytes, Crude, No. 1..... 9.00@10.00
Chalk, in bulk.....℔ ton 2.00@ 2.60
Chalk, in bbls .....℔ 100 ℔ ...@ .35
China Clay, English..℔ ton 12.00@17.50
Cobalt, Oxide.....℔ 100 ℔ 2.20@ 2.50
Whiting, Common. ℔ 100 ℔ .40@ .60
Whiting, Gilders ..... .45@ .65
Whiting, extra Gilders'.... .55@ .58

Putty.
In bladders $2.25
In bulk..... 1.25
In cans 1 ℔ to 5 ℔..... 3.25
In cans 12 ℔ to 25 ℔..... 2.25

Spirits Turpentine.
In Southern bbls.....38 @38½
In machine bbls .....38½@ 39

Glue.
Cabinet .....11½@16
Extra White.....18 @23
French.....12 @40
Irish .....13½@16
Low Grade.....℔ ℔ 9 @12
Medium White..... .14½@16½

Animal, Fish and Vegetable Oils.
Linseed, City, raw.....℔ gal 60 @61
Linseed, City, boiled.....℔ 62 @63
Linseed, State and West'n, raw.60 @61
Linseed raw Calcutta seed..... @85
Lard, Prime..... 77 @77
Lard, Extra No. 1.....52 @54
Lard, No. 1.....45 @46
Cotton-seed, Crude..... @ ..
Cotton-seed, Summer Yellow, prime.....35 @37
Cotton-seed, Summer Yellow, off grades.....34 @36
Sperm, Crude..... @ ..
Sperm, Natural Spring.....60 @61
Sperm, Bleached Spring..... @65
Sperm, Natural Winter.....61 @63
Sperm, Bleached Winter.....66 @68
Tallow, Prime.....57 @58
Whale, Crude..... @ ..
Whale, Natural Winter.....45 @46
Whale, Bleached Winter.....47 @48
Menhaden, Crude, Sound..... @26
Menhaden, Light Strained.....30 @31
Menhaden, Bleached Winter...33 @34
Menhaden, Ex Bleached Winter35 @36
Cocoanut, Ceylon..... 6½@ 6¾
Cocoanut, Cochin..... 7¾@ 9
Cod, Domestic.....32 @33
Cod, Newfoundland.....35 @36
Red Elaine..... @42
Red Saponified.....℔ ℔ 5½@ 6¼
Olive, Italian, bbls.....58 @62
Neatsfoot, prime.....52 @53
Palm, prime, Lagos.....℔ ℔ 5½@ 5¾

Mineral Oils.
Black, 20 gravity, 25@30 cold test.....℔ gal. 9½@10½
Black, 29 gravity, 15 cold test. 10½@11½
Black, summer ..... 9½@ 9½
Cylinder, light filtered..... 14½@17½
Cylinder, dark filtered..... 11½@15½
Paraffine, 903-907 gravity..... 12½@12¾
Paraffine, 903 gravity..... 11½@11¾
Paraffine, 883 gravity..... 9½@10
Paraffine, red, No. 1 ..... 12¾@12¾
In small lots ¼c advance.

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CURRENT METAL PRICES.

NOVEMBER 6, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ lb; Square, 0.8¢ ₩ lb
1 to 1⅝ in. round and square ..... ₩ lb 1.85@1.95¢
1¼ to 4 in. x ⅜ to 1 in. .....
Refined Iron:
1 to 1¾ in. round and square..... ₩ lb 1.90@2.00¢
1¼ to 4 in. x ⅜ to 1 in.....
1¼ to 4 in. x ¼ to 5-16..... ₩ lb 2.05@2.15¢
Rods—⅝ and 11-16 round and square. ₩ lb 2.25@2.35¢

Angles:	Cts ₩ lb
3 in x ¼ in. and larger	2.30¢
3 to 3½ in. x 3 16 in	2.30¢
1¼ to 3 in. x ¼ in	2.30@2.50¢
1¼ to 2¾ in. x 3-16 in and thicker	2.10@2.20¢
1 to 1¾ in. x 3-16 in	2.20@2.30¢
1 to 1¾ x ⅜ in	2.30@2.40¢
⅞ x ⅛ in	2.40¢
⅞ x ¼ in	2.50¢
⅝ x ¼ in	3.50¢
⅝ x ⅛ in	4.50¢
½ x 3-32 in	
Tees:	
in	2.80¢
1¼ in	2.60¢
1½ in, and larger	2.50¢
Beams	2.50¢
Channels, 3 in. and larger	2.50¢
Bands—1¼ to 6 x 3-16 to No. 8	₩ lb 2.30¢
"Burden's Best" Iron, base price	₩ lb 3.15¢
Burden's "H. B & S. Iron, base price	₩ lb 2.95¢
"Ulster"	₩ lb 3.60¢
Norway Bars	3 75@4.25¢
Norway Shapes	4.00@4.50¢

Merchant Steel from Store—

	per ₩ lb
Bessemer Machinery	1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe	2.00@2.50¢
Best Cast Steel, base price in small lots	7½¢
Best Cast Steel Machinery, base price in small lots	6 ¢

Soft Steel Sheets—

¼ inch	2.20¢	No. 14	3.00¢
3-16 inch	2.30¢	No. 16	3.20¢
No. 8	2.40¢	No. 18	3.40¢
No. 10	2.60¢	No. 20	3.70¢
No. 12	2.90¢	No. 22	3.80¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16	₩ lb, 3.75	3.80¢
Nos. 18 to 21	₩ lb, 3.85	3.90¢
Nos. 22 to 24	₩ lb, 3.95	4.00¢
Nos. 25 and 26	₩ lb, 4.05	4.10¢
No. 27	₩ lb, 4.15	4 20¢
No. 28	₩ lb, 4.25	4.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ lb 11@18¢
Patent Planished ₩ lb A, 12¢; B, 11¢, net

Galvanized.

	B. B.
Nos. 10 to 16	₩ lb, 12¢
Nos. 17 to 21	₩ lb, 13¢
Nos. 22 to 24	₩ lb, 14¢
Nos. 25 to 26	₩ lb, 15¢
No. 27	₩ lb, 16¢
No. 28	₩ lb, 17¢
No. 29	₩ lb, 19¢
No. 30	₩ lb, 21¢

65% off

30 in. 1¢ ₩ lb higher.

Foreign Steel from Store—

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 18 @ 20 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 13 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12 ¢
R. Mushet's "Special"	₩ lb 40 ¢
" " " Annealed	₩ lb 75 ¢
" " "Titanic"	₩ lb 19 ¢
Hobson's Choice XX Extra Best	₩ lb 35 ¢
Jessop Self Hardening	₩ lb 45 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson's "Soho" Special Self-Hardening	₩ lb 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free. Per ₩ lb

Banca, Pigs	25½@26 ¢
Straits, Pigs	25½@26 ¢
Straits in Bars	26½@27 ¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$7.50
IX, 14 x 20	9.00
Melyn Grade:	
IC, 14 x 20	7.00
IX, 14 x 20	8.50
Allaway Grade	
IC, 14 x 20	6.50
IX, 14 x 20	7.80

American Coke Plates—Bessemer—

IC, 14 x 20 108 ₩	$6 5 @6.75
IX, 14 x 20	$7.25@7.50

American Terne Plates—

IC, 20 x 28	$11.50
IX, 20 x 28	13 50

Tin Boiler Plates, American—

XX, 14 x 20 112 sheets	$16.00
XX, 14 x 28 112 sheets	17.00
XX, 14 x 31 112 sheets	18.50

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	17¼@17½¢
Ansonia grade Casting	16¾@17 ¢

Sheet and Bolt—

January 19, 1900. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	54 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	36 oz. to 64 oz., 25 to 50 lb.	24 oz. to 32 oz., 18¾ to 25 lb.	16 oz. to 24 oz., 12½ to 18¾ lb.	14 oz. and 15 oz., 11 to 12½ lb.	12 oz. and 13 oz., 9½ to 11 lb.	10 oz. and 11 oz., 7¾ to 9½ lb.	8 oz. and 9 oz., 6¼ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	21	21	21	21	22	23	24	27	30
30	96	72	21	21	21	21	22	24	27	30	
30	.....	96	21	21	21	21	23	27			
36	72	.....	21	21	21	21	23	25	28	31	
36	96	72	21	21	21	23	23	27	30		
36	120	96	21	21	21	23	24				
36	.....	120	21	21	23	23					
48	72	.....	21	21	22	23	25	28	31		
48	96	72	21	21	22	24	26	29			
48	120	96	21	21	23	25	29				
48	.....	120	21	22	24	27					
72	72	.....	21	22	22	24	27	32			
60	96	72	21	21	23	25	30				
60	120	96	21	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	21	22	24	29					
72	144	96	21	23	26	31					
72	.....	144	22	24	29						
108	120	.....	22	24	30						
108	.....	120	24	25							
wider than 108	144	.....	25	27							
	.....	144	26	29							

Rolled Round Copper, ⅜ inch diameter and over, ₩ lb 21¢.
Circles, Segments and Pattern Sheets, 3¢ ₩ lb advance over price of sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ lb over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ lb over the foregoing prices.
All Polished Copper, 20 in. wide and under 1¢ ₩ lb advance over the price for Cold Rolled Copper.
All Polished Copper, over 20 in. wide, 2¢ ₩ lb advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ lb more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ lb	25¢
12 oz. and up to 14 oz. to square foot, ₩ lb	30¢
10 oz. and up to 12 oz., ₩ lb	2 c
Lighter than 10 oz., ₩ lb	31¢

Circles less than 8 in. diameter, 2¢ ₩ lb additional.
Circles over 13 in diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.
Last March 2, 1900.

Nos.	0000 to 8 Base	9 and 10		11 and 12	
	½¢			¾¢ ₩ lb adv.	
Nos.	14	15	16		
	¾¢	1¢	1¼¢ ₩ lb adv.		
Nos.	17	18	19	20	
	1¼¢	2¢	2½¢	2¾¢ ₩ lb adv.	

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.
Feb. 6, 1899. Net. Outside Diameter.

Stubs' W.G.	B. & S. W.G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	40	38	36	33	32	31	30	30	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	61	46	42	39	36	35	34	32	31	30	28	27
19	17	62	47	43	40	37	36	35	34	33	32	30	29
20	18-19	64	49	44	41	39	38	37	36	35	34	32	31
21	20	66	51	46	43	41	40	39	38	37	36	35	34
22	21	71	55	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 8¢ ₩ lb additional.

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
36	32	29	27	21	21	21	21	21	21	21	21	26	23	25	27 2¢ ₩ lb

Copper, Bronze or Gilding Tubes, 3¢ ₩ lb additional.

Brazed Brass Tubing.

(*To No. 19, inclusive.*) Feb. 26 1896
Brown & Sharpe's gauge standard.

	Per ₩ lb.
Plain Round Tube, ¾ in. up to 2 in.	$0.35
" " ⅝ " ¾ "	.36
" " ½ " ⅝ "	.38
" " ⅜ " ½ "	.41
" " 5-16 " ⅜ "	.48
" " ¼ " 5-16"	.65
" " 3-16 " ¼ "	1.00
" " ⅛ " 3-16"	1.50
Smaller than ¼ inch	Special
3 inch and larger	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.
Discount from list 5

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39
Common High Brass Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	
To No. 20, inclusive	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.
Add 1¢ ₩ lb additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List 20%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive	$0.23	$0.27	$0.28
Above No. 10 to No. 16	.23½	.27½	.28¼
No. 17 and No. 18	.24	.28	.32
No. 19 and No. 20	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	3.75

Discount, Brass Wire, 20%; Copper Wire, Net.
List November 16, '96.
Spring Wire, 2¢ ₩ lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ lb, net 20¢
Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ lb net 21¢
Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ lb

Western Spelter	4½@4.60¢

Zinc.

Duty: Sheet, 2¢ ₩ lb.

600 lb casks	6¾¢ | Per lb 7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ lb. Pipe and Sheets, 2½¢ ₩ lb.

American Pig	4.62½@4¾¢
Bar	5⅛@5¼¢
Pipe	6¾¢ 20% off
Tin Lined Pipe	10½¢ 20% off
Block Tin Pipe	37½¢ 20% off
Sheet Lead, full rolls	7½¢ 20% off
Sheet Lead, cut	7¾¢ 20% off
Old Lead in exchange, 4¢ ₩ lb.	

Solder.

½ & ½, guaranteed	17 @17½¢
No. 1	14 @15½¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson	₩ lb 10½@11¢
Hallett's	₩ lb 8½@9½¢
U. S.	₩ lb 8½@9 ¢

Aluminum—

Duty: Crude, 8¢ ₩ lb. Plates, Sheets, Bars and Rods, 13¢ ₩ lb.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:
Small lots ₩ lb 37¢
100-lb lots ₩ lb 35¢
No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:
Small lots ₩ lb 34¢
100-lb lots ₩ lb 33¢

Aluminum Sheet, B. & S. gauge. 50 lb or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ lb.	₩ lb.	₩ lb
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 lb 5¢ ₩ lb extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ lb 40¢	No. 15	₩ lb 43¢
No. 9 to No. 10	₩ lb 40½¢	No. 17	₩ lb 50¢
No. 11	₩ lb 41 ¢	No. 18	₩ lb 55¢
No. 12	₩ lb 41½¢	No. 19	₩ lb 60¢
No. 13	₩ lb 42 ¢	No. 20	₩ lb 65¢
No. 14	₩ lb 43½¢	No. 21	₩ lb 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ lb 14½¢
Light and Tinned Copper	₩ lb 13½¢
Heavy Brass	₩ lb 9½¢
Light Brass	₩ lb 7½¢
Lead	₩ lb 4 ¢
Tea Lead	₩ lb 3½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 17½¢
No. 2 Pewter	₩ lb 8½¢
Tin Plate scrap	₩ ton $8.50 @ 9.00
Wrought Scrap Iron	₩ gross ton $10 50@ 11.00
Heavy Cast Scrap	₩ gross ton $10 25@ 10.50
Stove Plate Scrap	₩ gross ton $7.25@ 7.50
Burnt Iron	₩ gross ton $5.00@ 5.50